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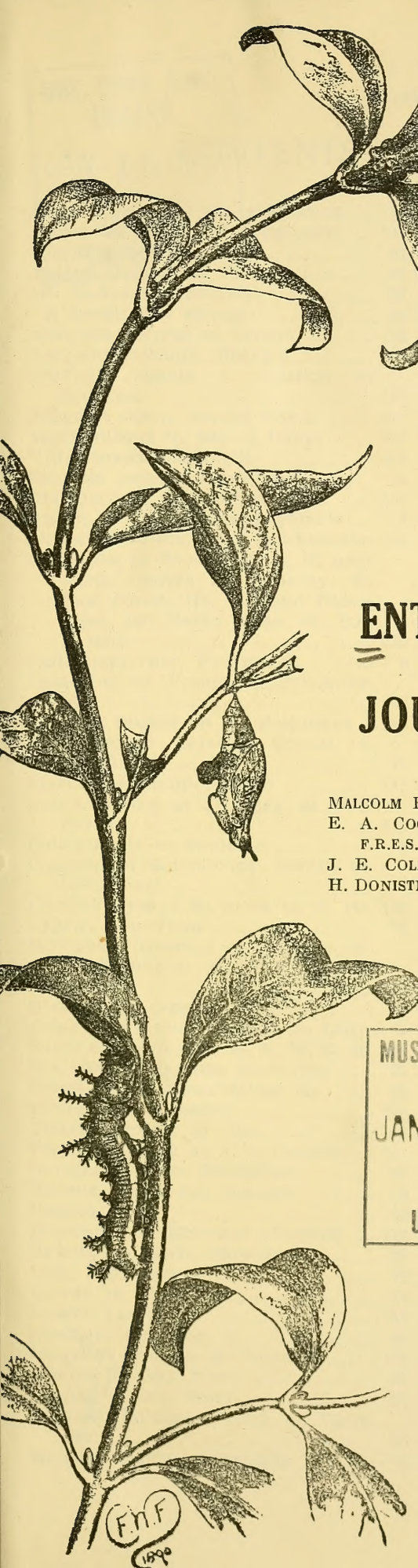
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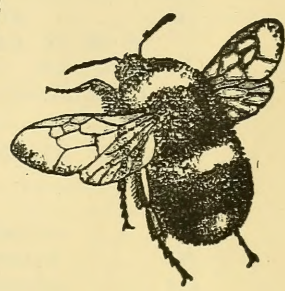
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JOURNAL OF VARIATION

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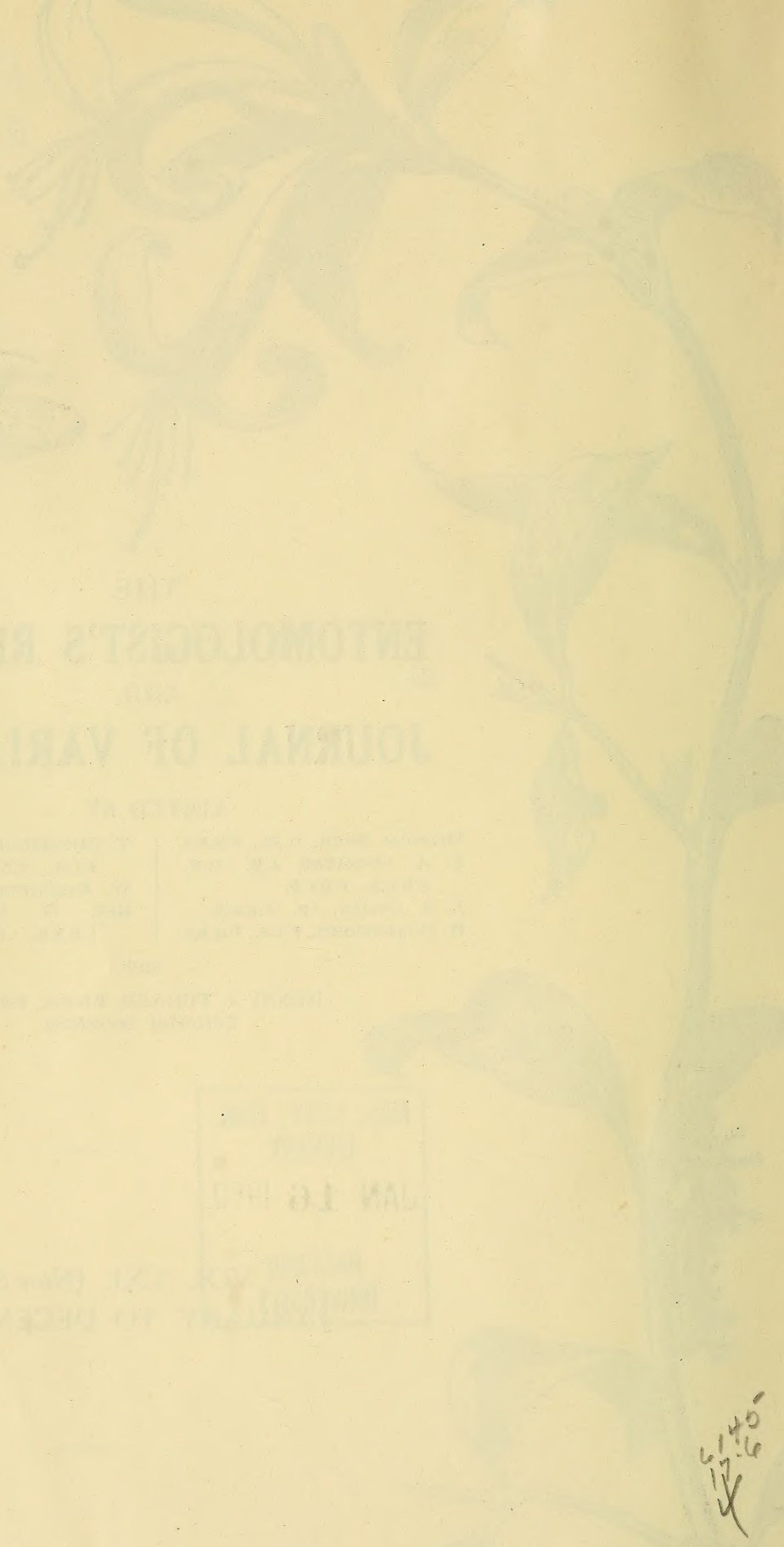
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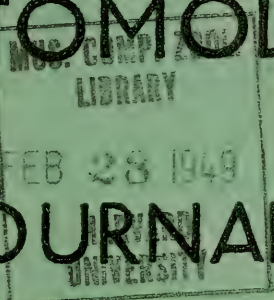
- p 18, line 19. For "Durrant, 1911" read "Durrant 1911."
- p. 30, line 19. For "Aarnalen" read "Annalen."
- p. 44, line 4. For "Mentrastri" read "menthastri."
- p. 44, line 13. For "very slowly," read "very slowly;."
- p. 47, line 2. For "Tinaeidae" read "Tineina."
- p. 47, lines 10, 12. For "Meesia" read "Meessia."
- p. 47, line 19. For "phegaea" read "phegea."
- p. 48, line 6 from bottom. For "Chalonia" read "Phalonia."
- p. 49, line 22. For "peliodactyla" read "pelidnodactyla."
- p. 71, line 9 from bottom. For "portions" read "patches."
- p. 71, line 3 from bottom. For "pneumonantus" read "pneumonanthos."
- p. 72, line 5. For "Litticolletis" read "Lithocolletis."
- p. 72, line 7. For "Symphoricercus" read "Symphoricarpus."
- p. 72, line 19. For "appear" read "appeal."
- p. 72, line 30. For "from" read "for."
- p. (57), line 13 from bottom. Delete "Sam."
- p. (57), line 12 from bottom. For "Mer. (1815)" read "Meyrick 1895."
- p. 75. For "PYRAES" read "PYRALES."
- p. 83, line 10 from bottom. For "has" read "have."
- p. 96, line 6. For "Ales . . . squento cui somelis" read "Alae . . . sequente cui similis."
- p. (65), line 23. For "procae" read "procax."
- p. (67), line 4, etc. For "1786" read "1787."
- p. 105, line 14 from bottom. For "Lucania" read "Leucania."
- p. (73), line 2. For "Bosa" read "Boica."

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HOW MANY BROODS ARE THERE OF *LYCAENA PHLAEAS*, L.?

By P. SIVITER SMITH.

When examining the various books and magazines for details of *L. phlaeas*, L., I continually come across references to "fourth broods" of that butterfly in Britain, usually in October, and I find the same comments in correspondence lately. It is my clear impression at the moment that in Britain there are never more than three broods and, even then, any third brood is only a partial one.

I have carefully examined the life-histories of *L. phlaeas*, as described by Tutt (*Brit. Lep.*, VIII) and Frohawk (*Nat. Hist. of Brit. Butt.*) and have drawn up charts to give a clearer picture of what may be expected to happen each year. From this examination I feel sure that we can expect only a partial third brood as a maximum in a very favourable year. Hot, sunny weather is what suits this species best, in all its stages.

Let us assume a year where the weather is as favourable as possible for *L. phlaeas*, with a preceding winter that has plenty of mild sunny periods during which the hibernating larvae will move about and even feed a little. Thus we can expect those most advanced in the preceding autumn (and it hibernates in various instars) will be able to take advantage of a fine early spring and emerge at an exceptionally early date. Throughout this speculation we are going to assume the very best possible conditions.

It is hardly likely even then that we shall find an imago before the first week in April, so ova will be deposited at that time. Now the shortest time before ova hatch is 5 days or thereabouts, and the summer larval stage lasts at its shortest about 20 days and the pupal stage about 25 days. It will be reasonable to allow for a rapid metamorphosis of 6, 23 and 28 days respectively, so that under these (imagined) best conditions, from egg to imago takes 57 days. Let us say two months.

From the earliest emergences at the beginning of April, therefore, we shall expect to see the next earliest emergences at the beginning of June; from emergences at the beginning of June we shall expect to see the earliest emergences at the beginning of August, and the next series will emerge at the beginning of October. Thus, in order to cram four emergences into one year we have to allow the finest possible theoretical conditions right through each brood. We have to allow for an exceptionally early emergence in April and then we must allow for these spring larvae and pupae to mature in the shortest (normally mid-summer) period, whereas they would actually take longer than those feeding up in mid-summer. It is scarcely to be expected that these optimum conditions will occur very frequently.

I have a great many references collated for *L. phlaeas* and I have scanned these in respect of these favourable factors, to see how often they may be expected to occur. In respect of very early emergences, I find two remarkable ones in February, both in the Isle of Wight, one on 10th February (Fassnidge) and one at the end of February (Cornell). Apart from those two exceptional dates, Dale gives the next earliest date of 2nd April and there are about four other April records, so that clearly April is not normally the time even of early emergences. In this respect H. B. Williams appears to be correct when he says the usual dates when the species is first seen are between 15th and 20th of May.

Thus, in respect of our optimum requirements, it seems clear that it is exceptional to get emergences at the beginning of April and this is therefore strongly against the possibility of getting four broods in a year. In Central Italy, under much hotter conditions, Verity says there are only four broods (and less in higher localities), these being in April, the end of June, the middle of August, and in a favourable autumn, another brood in October, but he says that even this is only a partial fourth brood.

In respect of the latest dates on which *L. phlaeas* has been observed in Britain, Dale gives the latest of all, namely 8th November, and there are two other November dates, one on the 3rd (Dale), and de Worms records it as still on the wing in November (1944); there are more records for October and that seems to be the last month in which one can usually expect to see it flying.

My own opinion is that I doubt if a fourth brood has ever been observed in Britain and that specimens seen in September, October and November represent a third brood, and only a partial third brood at that. This opinion is supported by F. V. L. Jarvis (1944), who gives the result of his observations which exactly coincide with this view. In further support of this, I have (by the kindness of H. J. Turner) been able to examine the Diary kept by the Rev. C. R. N. Burrows from 1871-1922. He apparently entered daily every species he observed and although no doubt the conditions of observation altered frequently, it is such a long period that a reasonable average can be arrived at. I have tabulated the 110 observations and a graph is obtained which shows the following: May—20 records; June—14 records; July—5 records; August—46 records; September—17 records; October—8 records.

The records start on 14th May and show most observations between the 18th of May and the 2nd of June; there are thin records from the 4th to the 30th June, and then there is a blank until another set of records starts thinly on 20th July and giving the greatest series between the 4th and 29th of August. There are thin records through September, most frequent between the 9th and the 15th, and a few between the 20th and 28th. There is one record each on 3rd and 4th October, and a small series between the 8th and 12th of that month.

The chief densities of these records, then, is from mid-May to mid-June, from early August to the end of August, and in mid-September and mid-October, but the September and October records are much thinner and less definite than the others.

When these are plotted out, it gives a picture that is exactly similar to what I believe actually happens—in the case of each brood we get a lengthy emergence period, due to the variation in the speed with which larvae of the same brood feed up. This is carried on during the year and so in the autumn we get long extended emergences, some of these late ones being particularly slow or delayed second brood specimens, and others being particularly advanced third brood specimens. The larvae of all broods, but particularly the late broods, feed up at different speeds; many authorities refer to this and I found the same thing when I reared the species and hibernated it. This mixture, in the autumn, of delayed second brood specimens and advanced third brood specimens would also account for the fact that “summer” (or suffused) forms occur in company with “autumn” (“cold,” or non-suffused) forms.

Naturally further north in Britain we shall expect only two broods in a year, and perhaps only one. There is not a great deal of accurate information in regard to this aspect either and detailed observations are much to be desired. That is the object of this note, as I am seeking all forms of information regarding *L. phlaeas* and this brood question is so obscured at present by the popular but (I believe) incorrect fourth brood theory. I shall be most grateful for results of careful observations in all parts of the British Isles that help to settle this, and the aspects referred to in this note may help to point to the factors surrounding these events—the brightness or suffusion of autumn specimens helps to point to whether they are second or third brood examples. I have not quoted any references in full, nor all those that I have, as I hope to give all these later in a more extensive review of this species, for which this information is required.

21 Melville Hall, Holly Road,
Edgbaston, Birmingham 16.

AN ACCOUNT OF THE EIGHTH INTERNATIONAL CONGRESS ON ENTOMOLOGY,

HELD IN STOCKHOLM FROM 9TH TO 14TH AUGUST 1948.

By C. G. M. DE WORMS, M.A., Ph.D.

A big contingent set out from this country during the first days of August, the majority converging on Lund in the south-western corner of Sweden. After a long train journey through Holland, Northern Germany and Denmark, many of the British delegation, including myself, reached Lund early on 7th August. That afternoon was spent visiting several scientific institutions, among which the Station of Plant Research was especially interesting. The party was shown the latest methods of dealing with pests affecting oil-producing plants such as rape.

On Sunday, the 8th, about 150 delegates met in the Zoological Museum to hear a speech of welcome by Prof. Hanström and an account of the many famous workers in entomology who carried out their researches and teaching in the ancient University. After conducted

tours of the well-known Museum of Cultural History and the renowned Cathedral, delegates were entertained to a dinner at the Grand Hotel by the Entomological Society of Lund. Later that evening most of the party left by train for Stockholm, which was reached early on 9th August.

In this fine city some five hundred delegates and guests from nearly every country in the world assembled for the Congress proper, which was officially opened that afternoon in the spacious Concert Hall by the Prime Minister of Sweden, Dr Erlander. After an address of welcome by the President (Prof. Trädgårdh), Dr Karl Jordan, Permanent Secretary to the Congresses on Entomology, gave a most illuminating account of the history of the past Congresses and the objects of the present one, while Professor Jeannel, of Paris, followed with an amusing speech on behalf of the delegates. Later that day the delegates were invited to a special social evening at Hasselbacken, one of the leading entertainment resorts of the city.

The main business of the Congress opened on the morning of 10th August at the modern High School of Ostermalms Laroverk. In all, six separate sessions were held. 187 papers by 163 authors were submitted for reading under eleven sections, including Systematic Entomology, Physiology, Oecology, Morphology and Anatomy, Insects of Agricultural Interest, Forest Entomology, Stored Product Insects, Medical Entomology, Means and Methods of Fighting Insect Pests, Nomenclature and History, Arachnidae. Many eminent authorities on these subjects from all over the world contributed papers of very great interest and importance, while the sessions in general afforded a means for discussing at length questions and problems of Entomology, both academic and economic, of great international consequence, such as the war against the locusts, the tsetse flies and the malaria mosquitos. The field of insecticides in the control of these and other insect pests was also a subject well to the fore in the programme, which also included many interesting papers on the morphology, taxonomy, habits and distribution of special families in the insect world. The Congress also gave opportunity of many personal contacts among leading entomologists of all nations. The sessions were concluded on the afternoon of Saturday, 14th August, by a very entertaining speech by the President, who thanked all who had attended for their contributions to the success of the Congress and recalled many of his own experiences during his entomological activities.

During the week the entertainment of the delegates had been arranged on a very big scale. The whole of Wednesday, the 11th, had been devoted to an excursion to the ancient University town of Upsala. En route the party were conducted round Linnaeus's famous home at Hammarby, which is kept exactly as it was at the time of his death. Everyone was most interested to see so many of the writings and possessions of this great savant. At the University many famous literary treasures were on view in the Museum, while the collections of Linnaeus and Thunberg were exhibited in the Zoological Institute. The day ended with a welcome from the Rector of the University and a visit to the Cathedral. A further delightful excursion was made on the evening of 12th August to the royal castle of Drottningholm, where the

party was conducted over the famous gardens and saw a performance in the Court Theatre, which was the original structure built in 1762. On the 13th another most interesting visit was paid to the Forest Research Institute and the very modern Museum of Natural History on the outskirts of Stockholm. At the latter the large party had the opportunity of seeing the very fine displays in the public galleries and also of studying much of the entomological material in the National collections. Later delegates were the guests of Swedish entomologists at a lunch in the Museum. This function was one of nine similar entertainments culminating on Saturday the 14th with a big reception and dinner in the famous Town Hall as guests of the Corporation. The Mayor of Stockholm welcomed the guests, while Prof. Jeannel replied on their behalf and Prof. Trädgårdh made a speech of farewell. On the following day a large gathering took part in a very pleasant trip by steamer around the islands in the direction of the Baltic. So ended a most delightful and interesting week of which all must have brought back the happiest memories, thanks to the excellent organisation of the Congress Committee and the unstinted hospitality of their Swedish hosts. Many prolonged their stay in Scandinavia by going on two arranged excursions, one to the Forest Research headquarters in Central Sweden and another lasting four days to Abisko in Northern Lapland, where many sub-arctic species of insects were obtained.

COLLECTING NOTES.

MELANIC *BOARMIA REPANDATA* AT RANNOCH, PERTSHIRE.—Some few years ago I was indebted to Mr R. C. R. Crewdson for the opportunity of studying the incidence of the melanic form of this species, ab. *nigricata*, Fuchs, in a wild population at Rannoch.

In June 1942 Mr Crewdson sent me 93 pupae which he had bred from larvae beaten at Rannoch. From these pupae I bred 85 moths during the same month, of which 37 males and 44 females were of the ordinary Rannoch grey form, and 3 males and 1 female were black. The exact proportion appears to be 95.3% grey, 4.7% black, and it would probably be sufficiently accurate to state the proportion of the black form in the population as 5%.

The black form breeds as a simple dominant; and on the assumption that the examples bred were heterozygous it is apparent that homozygous examples must be very rare indeed at Rannoch, forming probably less than one in every thousand of the population.

I was able to obtain a pairing between a black male and a grey female. Unfortunately, the larvae fed too rapidly in the autumn, and in consequence did not hibernate very well, but in 1943 I bred from this pairing four males and two females of the black form and six males and two females of the grey form, i.e., 42.9% black and 57.1% grey. These figures, particularly having regard to the small numbers bred, do not depart too widely from the 50 : 50 proportion which should result from pairing a heterozygous black with a recessive grey, and it may be taken as established that the male parent was heterozygous.—
HAROLD B. WILLIAMS, K.C., LL.D., F.R.E.S.

PTINUS TECTUS, BOIELD. (COL., PTINIDAE).—Shortly after reading the proof of Mr Donisthorpe's interesting note on this beetle, I came across an airtight tobacco box while tidying out a "glory hole" in my bug room. This box was brought to me in 1943 with some Brazilian flour in which were some adult *P. tectus* beetles together with a piece of paper giving the data; there were possibly some six specimens and about a quarter of an ounce of flour. The box had not been opened since, but I found in it about twenty dead and dismembered *P. tectus*, eight living adults, and some small larvae in the frass within the box. There was no flour, and the paper was riddled with holes which had reduced its size to about one-tenth. Many generations of this beetle must have been raised on the bodies of their parents and brothers, yet the size of the present adults seems to be about normal. My experience of the beetle is that its usual haunt was the place in warehouses where floor sweepings were kept; larvae eat almost anything from Soya bean flour to rats' excreta, so that the cannibalistic diet of the present specimens does not come as a surprise. Being a domestic species of small size, and somewhat retiring habits, the three specimens mentioned in association with the human aesophagus could well, in my opinion, have been introduced afterwards.—S. N. A. J.

THE FOODPLANTS OF *CALLOPHRYS RUBI* IN THE INNER HEBRIDES.—In the Hebrides, last season, the latest example of this insect was seen on the wing on the south side of Loch Scresort, Isle of Rhum, on 10th June. This was a worn female, noted flitting around bilberry, which forms the insect's primary foodplant in the islands. Later, on 1st July and 8th August, larvae were swept from heather on the Isles of Coll and Rhum, respectively. In this connection, it should be noted that, in addition to the two foodplants named above, larvae have been swept in the Raasay-Scalpay group of islands from the fine-leaved heath and black crowberry.—J. W. HESLOP-HARRISON, King's College, Newcastle-upon-Tyne.

CURRENT NOTES.

THE *Bull. et Ann. Soc. Ent. Belge.* is issued very regularly now and much original work is being recorded. The September and October numbers contain 220 pp., with diagrams, 2 maps and many text figures. The September issue contains *Mémoires* and Two Sections of Arthropodes, viz., the Nudicoles and the Cavernicoles of Belgium, two New *Carabidae* from Africa.

THE Report of the 85th Annual Meeting of the Entomological Society of Ontario has been published. The issue has rather a spectacular cover with richly coloured Saturniid Moth, a *Colias*. It opens with a capital portrait of H. H. Lyman, one of the greatest entomologists of Canada, and whose tragic death by drowning was a great calamity to science. Other photographs and historical reminiscences make this small issue a very worthy historical publication.

THE Spanish Entomological Journal *Eos* comes out quite regularly now. Part 3 of Vol. XXIV (1948) has reached us. Herr M. Goch, of Dresden, contributes Pt. II of his Memoirs on the *Zygaenidae* of Spain and deals with *Z. purpuralis*, *Z. scabiosae*, *Z. achilleae*, *Z. nevadensis*, *Z. sarpedon*, and many aberrant forms are discussed, especially of the last species. Dr Uvarov contributes an article on the Orthoptera of Spain, described many years ago by Rambur. R. Agenjo discusses 3 new subspecies of *Anthrocera*, of *A. rhadamantha*, of *A. fausta*, and of *A. trifolii*.

THE Belgian *Lambillionea*, Parts 7-8, records the decease of Dr Arnold Pictet, the well-known and well-honoured Professor of Geneva. Additions to the fauna are reported, the beetle, *Tenebrio molitor*, as a pest, is discussed; the continuation of the survey of Rhopalocera in the various Departments of Belgium.

Parts 9-10 contain a discussion of the Variation of the S. African *Papilio dardanus*, particularly f. *antinorii*, a case of atavism in *Erannis leucophaearia*, and a note on the Belgian Fauna.

ANOTHER correspondent writes, "Why not publish a List of all Genitalic Species of Lepidoptera, including Micros, with references?"

THE whole question of Genitalic Species in Zoology must be based on the term Species. What is our concept of the term, is it a definite or indefinite natural object, or is it merely a useful term to aid in our classification of the actual organisms by which we are surrounded?

DR JOHN ADAMS COMSTOCK has retired from the post of Chief in the Los Angeles Museum after more than 20 years' service. He had become widely known as the author of a valuable work, *The Butterflies of California*, and had written many articles and records of local Lepidoptera.

As there were eleven sections into which the work of the International Congress was divided, it was almost impossible for any member to attend more than two and note the sectional matter discussed. If any member of the Congress could give us anything which was discussed on Nomenclature, Variation, and the abuse of the study of Genitalia to make Species, please send us a note. It may be a long time before we get the volumes which contain the papers presented to the Congress.

IN the *Ent. Bericht* of the Netherlands, Mr Lempke concludes a very full Report on the Immigrant Lepidoptera to the country in 1946. The 25 species are recorded with full and interesting Notes.

VOLUME XLVI (1947) of *Lambillionea* has made great strides to bring the famous little journal back to its pre-war status. Not only does it report on Belgian entomological matters but in the August issue (5-8) an educative article was begun, "Les Papillons Mimétiques," by S. G. Kiriakoff. This article was completed in the December issue (11-12) with three plates, containing figures of five Pierid forms and 9 Papilionid forms.

THE two Entomological Magazines of Sweden *Opuscula Entomologica* and *Ent. Tidskrift*, both come regularly. Some of the articles are in

English and some have a Summary of the text in English. Vol. XIII, part 2, 1948, of the former has an article, "A Few Words on Entomology in the University of Lund" (English). The next paper is on Diptera in German. A memoir on a new Cockroach from W. Africa is in German. The next article is in English, a biological discussion. Another article in English follows, dealing with a new species of the Odonata with notes on the group *Anisogomphus*. The shorter contributions are mainly in English with an added note or two in English and German.
—HY. J. T.

REVIEW.

CATERPILLARS OF BRITISH MOTHS, INCLUDING EGGS, CHRYSALIDS AND FOODPLANTS. Compiled and arranged by W. J. Stokoe, and edited with Special Articles by G. H. J. Stovin, M.R.C.S., etc. 2 vols., 1488 figures, of which 441 are in full colour by J. C. Dollman, R.W.S. 15/- each vol. Messrs Frederick Warne & Co., Ltd., Chandos House, Bedford Court, London, W.C.2.

These volumes are a valuable addition to the Wayside and Woodland Library which Messrs Warne initiated years ago when the late Edward Step was at his best. Those who have the admirable volume of the subseries on British Lepidoptera, "Caterpillars of British Butterflies," so useful, will find them necessary companion volumes to the "Moths of the British Isles" of South.

Every figure of a Caterpillar is from Nature exactly as it chose its rest and assumes its proper natural specific posture, in accord with its protection necessity requires, aided also with the full coloration. The text in its descriptions of a Caterpillar uses every descriptive word needed. Not one figure of a Caterpillar is a blown skin on a featureless perch. The Caterpillar looks as if it had chosen its own perch, as it has done probably in every case. In identification this featuring is of the utmost importance even with the Caterpillars which are internal feeders. Special postures of hairy Caterpillars when fallen or species that rest on flat surfaces, bark of trees, etc., are dealt with. The Caterpillars of the Jersey Tiger in vol. I and of the Goat Moth in vol. II are excellent samples of the compilation; arrangement and execution are indicative of great thoroughness.

In addition the Chrysalis Stage is figured for comparison and aid in identification. Also the Egg Stage is illustrated by many figures as laid of natural size, and enlarged to show sculpturing; also as laid in Nature, scattered, in batches large and small, regular and irregular.

Opportunity is taken to deal with the rearing of Caterpillars to obtain Mendelian results: a well illustrated account of experiments by Dr G. H. T. Stovin in vol. I. At the end of vol. II is a considerable supplement with figures and short descriptions of about 300 plants needed in the rearing of Caterpillars. These figures are just the recognizable twigs which Caterpillars favour in Nature.

Needless to say the get up of the volumes and the arrangement of the matter is quite admirable. In fact every earnest student of the Lepidoptera must acquire these volumes.

HY. J. T.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge.

They should be sent to Mr H. J. TURNER, "Latemar," West Drive, Cheam.

Wanted—*A. vestilialis* from all parts of the British coasts except south; also *R. simulans* and *S. rorida* (obscura). Cash or exchange.—A. H. Sperring, Slindon, Fifth Avenue, Warblington, Havant, Hants.

Desiderata—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.

Wanted—I need specimens of *Lycaena* (*Heodes*) *phlaeas* from all parts of the world, particularly Scandinavia, Russia, Siberia, Madeira, Canaries, N. Africa, Middle East countries, and E. Africa; also varieties from British Isles or elsewhere. I will purchase these, or offer in exchange good vars. of British Lepidoptera or many sorts of foreign and exotic Lepidoptera.—P. Stutter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.

Wanted—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.

Wanted urgently for genetical purposes, pupae of *Selenia tetralunaria*.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.

Wanted—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—J. K. Goody, "Wel-don," 26 Carr Wood Road, Bramhall, Ches.

Sale or Exchange—R.E.S. *Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. **Wanted**, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 and 1928, 1941 and 1942. *Ent. Mont. Mag.*, 1922, 1924-5, 1933-41. List on application.—F. W. Smith, Boreland of Southwick, by Dumfries.

Wanted, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—R. W. Parflitt, 1 Dunsdon Avenue, Guildford, Surrey.

Wanted—Bristol board suitable for mounting Coleoptera. Also, Puton, A., 1878, "Synopsis des Hémiptères-Hétéroptères de France. Badonnel, A., 1943, *Faune de France*, No. 42, Psocoptères.—H. G. Stokes, 12 Roman Road, Salisbury, Wilts.

For Disposal—*Entomologist's Record*, Vols. 55 (1943) to 59 (1947) in parts, all in good condition. For cash, or in exchange for any of Dr Imms' Textbooks of Entomology including the latest.—Alan M. MacLaurin, Oldhall House, Kilmacolm, Renfrewshire

Wanted—For the British Museum larval collection, larvae of Chrysomelid beetles, alive or preserved. Liberal exchange if required.—Dr S. Maulik, British Museum (Natural History), Cromwell Road, London, S.W.7.

Wanted to Purchase—Pupae in any quantity of any species of moths.—R. M. Rickard, Coningsby, Lincoln.

Wanted to Purchase—*The Entomologist*, Vols. 1-78 (1840-1945).—J. M. Chalmers Hunt, 70 Chestnut Avenue, West Wickham, Kent.

Wanted to Purchase—African Section of Seitz' *Macrolepidoptera of the World*, both Butterfly and Moth Volumes, either bound or in parts.—D. G. Sevastopulo, c/o Ralli Brothers Ltd., P.O. Private Bag, Mombasa, Kenya Colony

Wanted—Distribution Records, Notes on Abundance and Information regarding Local Lists of the Dipterous Families Empididae and Conopidae.—Kenneth G. V. Smith, "Antiope," 38 Barrow Street, Much Wenlock, Salop.

For Disposal—Pupae of the following Hawk Moths, principally *pinastri* (several) and a few each of Poplar, Large Elephant and Privet. **Wanted in Exchange**—Aberrations of the Chalk-Hill Blue, *Lysandra coridon*, and some other species of butterflies. Lists of offers invited.—Chas. B. Antram, "Clay Copse," Sway, Lymington, Hants.

Wanted to Purchase—Leech's British Pyrales. Coloured Plate Edition.—A. W. Richards, Nether Edge, Hawley, near Camberley.

MEETINGS OF SOCIETIES.

Royal Entomological Society of London, 41 Queen's Gate, S.W.7.: February 2nd, March 2nd, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Friday in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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Change of Address:—The temporary address of Mr Kenneth J. Hayward of Tucuman will be, as from September, c/o Dept. of Entomology, British Museum of Natural History, London, S.W.7.

Communications received:—Thomas Greer, Fergus J. O'Rourke, O. Quercl, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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LXI.



No. 2

FEBRUARY 1949

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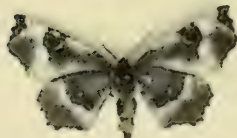
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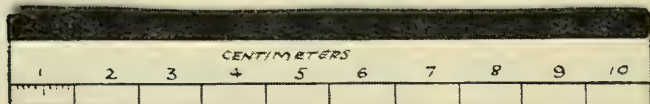
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MAR 14 1949

SELENIA TETRALUNARIA, HUFN., AB. NIGRESCENS, AB. NOV.

9

SELENIA TETRALUNARIA, HUFN., AB. NIGRESCENS, AB. NOV., WITH AN ACCOUNT OF ITS GENETICS.

By E. A. COCKAYNE, D.M., F.R.C.P., and H. B. D. KETTLEWELL, M.A.,
M.B., B.Chir.

In the summer of 1945 Mr J. M. Jaques took a female *Selenia tetralunaria* at light at Coulsdon, Surrey, which appeared to him to be normal, but must have been heterozygous for melanism. He gave some of the ova to Canon Edwards and kept some himself, but handed over his pupae to Mr Wakely. Mr Wakely put his normal and heterozygous moths into a cage together and allowed indiscriminate pairing to take place, so that his results are of no genetic value. He bred some melanic specimens, but lost the strain in 1947. Canon Edwards, in April 1946, from eggs of the wild female bred "normal" *tetralunaria*, though some were darker than usual (heterozygotes). He bred 3 ♂♂ and 9 ♀♀, obtained two pairings, and in the summer of 1946 bred an F2 generation consisting of three melanics, 2 ♂♂ and 1 ♀, and a number of normal and heterozygous moths, which were not counted. He paired a melanic male with a heterozygous female and a normal male with a melanic female, but mixed the two broods, and in the spring of 1947 bred an F3 generation consisting of 1 melanic ♀, 3 heterozygous ♂♂, and 2 normal ♂♂. He obtained a pairing, but from the eggs laid only three larvae hatched and these died.

Mr Jaques very kindly gave us 15 pupae, which he thought were from a pairing of two melanics, F3 generation, but the result showed that one parent was heterozygous. Mr C. N. Hawkins received (26.iv.1947) from Mr Wakely 26 ova from a pairing of a "normal" male with a melanic female, but evidently the male was a heterozygote.

The following table shows the results of subsequent breeding.

| | | Melanic. Heterozygous. | | | | |
|----------------------------|-------|------------------------|----|----|----|---|
| | | ♂ | ♀ | ♂ | ♀ | |
| Kettlewell | ..... | 4 | 3 | 5 | 3 | F3. First brood. |
| Kettlewell and Cockayne | ... | 5 | 11 | 4 | 10 | F3. ♂ heterozygote × ♀ melanic. Second brood. |
| Cockayne | ..... | 1 | 1 | 2 | 2 | F4. ♂ melanic × ♀ heterozygote. 4 (1947). Second brood. 1 ♂, 1 ♀ (1948). First brood. (heterozygotes). |
| Hawkins | ..... | 2 | 1 | 2 | 3 | F4. ♂ heterozygote × ♀ melanic. Second brood. |
| | | 12 | 16 | 13 | 18 | |
| | | 28 | | 31 | | |
| Cockayne | ..... | 22 | 14 | — | — | F3. ♂ melanic × ♀ melanic. Second brood. |
| Cockayne | ..... | 2 | 5 | — | — | F4. ♂ melanic × ♀ melanic. Third brood. |
| Cockayne | ..... | 17 | 21 | — | — | F4. ♂ melanic × ♀ melanic. 38 (1947). Third brood. 2 (1948). First brood. |
| | | 1 | 1 | — | — | |
| | | 42 | 41 | — | — | |

The four broods with one parent heterozygous and the other a homozygous melanic combined gave 28 melanic and 31 heterozygotes, the expected ratio being 1:1. The three broods with both parents melanic combined gave 42 male and 41 females, all melanic, and no heterozygotes. We hoped to obtain at least one pairing between a melanic and a normal specimen of unrelated stock, and later to obtain all the possible pairings in order to confirm these results and the conclusions arrived at, but the initial pairings were infertile and the strain was lost. There can, however, be no doubt that the melanic form is almost completely recessive to the normal, and that heterozygotes are on the whole recognizably darker than homozygous normals. It is, however, difficult to decide whether a living moth is a heterozygote or a homozygote. The moths of the spring brood appear to be more variable than those of the second and third broods, but our material is scanty. We found no difficulty in separating homozygous melanics from heterozygotes in the second and third broods, but we had no homozygous normals of the same strain to compare with the heterozygotes and for comparison had to rely on those of other strains. Melanics appear to be as hardy as heterozygotes under the good conditions in which they were bred, and in the broods of pure melanics the sexes are approximately equal. In the broods in which one parent was heterozygous and the other a homozygous melanic, there is a deficiency of males of both forms due to one brood consisting of 9 males and 21 females, but the brood is small and the discrepancy is not significant.

Infertility was very great as the following facts show. Mr Hawkins took pairings from moths of the F4 generation. (1) Heterozygote \times heterozygote—2 or 3 fertile eggs, the rest infertile. (2) Heterozygote \times melanic—pairing seen, 40 eggs laid, none hatched. Later he received (12.vii.1947) 31 eggs, melanic \times melanic, from Mr Wakely, of which 5 were fertile but none hatched, and 41 eggs typical \times typical, of which 6 were fertile and 1 hatched, and the resulting larva pupated. Our results were very similar. A pairing between two melanics of the F2 generation gave 7 fertile eggs, all of which hatched, but no moths emerged from the pupae. One of us (E.A.C.) took 5 pairings between moths of the F3 generation. The pairings were all seen and lasted the normal time: (1) Melanic \times melanic (3.vii.1947), all the eggs infertile. (2) Melanic \times melanic (3.vii.1947), most of the eggs infertile, 7 larvae hatched. (3) Melanic \times melanic (5.vii.1947), 110 eggs fertile, from which 105 larvae hatched. (4) Melanic \times melanic (4.vii.1947), all the eggs infertile or became pink and then collapsed. (5) Melanic from one brood \times heterozygous from another (11.vii.1947), 12 eggs fertile, 8 larvae hatched. Of the third brood two pairings were taken and the moths were seen paired. (6) Melanic \times melanic (25.viii.1947), all the eggs infertile. (7) Melanic \times melanic (27.viii.1947), no fertile eggs. In March 1948 Mr Moody kindly sent us 15 pupae from Devon. A melanic σ and a Devon ϕ , and a heterozygous σ and a Devon ϕ emerged the same day, and both males were large and vigorous. Only one pairing was seen, but both females laid large numbers of eggs, all of which were infertile. A Devon σ and a feeble melanic ϕ also hatched together, but no pairing was seen and no eggs were laid.

The larvae from the 105 eggs separated into two portions; the first grew very quickly and produced a third brood, small in size but as

melanic as the second brood; the second portion grew much more slowly and the larvae were very large, but most of them died in their cocoons or else failed to cast their larval skins completely, and from the eight normal pupae only three moths emerged in the spring of 1948.

HYBRIDS.

One of us (H.B.D.K.) obtained a pairing between a melanic male *tetralunaria*, F3 generation, and a female *bilunaria*. More than 100 fertile eggs were laid and were equally divided. All the eggs turned black, but none hatched. The other partner (E.A.C.) paired a heterozygous male *tetralunaria*, F4 generation, with a female *bilunaria*, and obtained 110 fertile eggs, all of which turned black. Only seven larvae hatched, from which seven pupae were obtained. One larva fed rapidly and produced a male imago, 25.viii.1947. The others fed slowly and six moths, all males, emerged between 19.i. and 3.ii.1948, one crippled. With the exception of the male of the third brood all were larger and darker than any other hybrids in the national collection, and one was decidedly darker than the others. We had hoped for a large brood in order to see whether the melanism of the *tetralunaria* affected the hybrid, for with a parent heterozygous for melanism, half the hybrids would receive the gene for melanism and half the gene for normal coloration. Half the hybrids might therefore have been darker than the rest. We have little doubt that one of the hybrids did show the influence of the gene for melanism, and possibly all those bred in the spring did so, but the third brood hybrid appears to be no darker than the usual hybrid *parvilunaria*. Several attempts were made to pair male *bilunaria* with female heterozygous *tetralunaria*, but no pairings were seen. Two females laid large numbers of eggs, a few of which turned pink and then rust colour, but all collapsed.

There is another melanic form, ab. *notabilis*, Thierry Mieg. (*Ann. Soc. ent. Belge*, 1910, 54, 386), the type of which is figured by Millière (*Icon*, 1870, Pl. 116, fig. 3) from a British specimen without data in the Doubleday collection. Barrett gives a rather poor figure of a similar specimen, a male (Pl. 295, fig. 1h), and says that several were bred from S.W. Yorkshire. He also says that F. Merrifield bred melanic specimens from Yorkshire ova, but I can find no reference to them in any of Merrifield's papers on this species. In the Rothschild collection there is a rather worn male very like Barrett's figure labelled "Rev. P. Andrews coll. 1872." It has another and much newer label in a different handwriting: "Bred F. Merrifield (*sic*) from strain from T. Bulty, Sheffield." The insect, however, is much too old to have been bred by Merrifield.

Lycklama à Nijeholt (*Tijdschr. Ent.*, 1932, 75, Suppl. 31, Pl. figs. 3, 4) has published an account of the genetics of a melanic form proving that it is a recessive with a heterozygote no darker than normal *tetralunaria*. Mr B. J. Lempke kindly sent me four of Lycklama's specimens, which are undoubtedly ab. *notabilis*, Th. Mieg., though not so bright as Millière's figure. One agrees very well with Barrett's figure and with the male in the Rothschild collection. Ab. *notabilis* is quite different from the melanic form described and named in this paper.

Ab. nigrescens, ab. nov.

Male (first brood). Upper side—All the normal markings are present, the darker parts of the fore and hindwing are deep smoky purplish-brown; the areas along the costa, which are usually pinkish-white, remain unaltered, but the other pinkish-white areas are more or less suffused with leaden grey. Under side—Much darker than usual, basal part of the hindwing dark orange more or less suffused with black scales, median band and terminal area dark orange heavily suffused with black. Thorax and abdomen dark brown without the usual orange on the ventral surface. Female (first brood). All the darker parts of the wings are smoky blackish-brown; the whitish areas on the costa and external to the postmedian line are very distinct and without the usual pinkish tint. The female has a much more black and white appearance than the male. Under side—The dark parts are blacker than those of the male; the basal part of the hindwing is orange heavily suffused with black scales, and the black suffusion completely hides the orange in the median band and terminal areas. Thorax and abdomen blackish-brown.

Male (second and third broods). Upper side—Costal areas whitish often suffused with grey; the darker parts blackish-brown, the paler parts visible but more or less suffused with grey. Female similar, but blacker. In some third brood specimens the whole of the paler parts of both wings, including the costal areas, are completely suffused with leaden grey. Under side—The darker parts are similar in colour to those of the upper side; the basal area is orange, the median band and terminal areas are orange-brown; the paler parts are only slightly suffused with grey.

Type—♂ (first brood), iv.1947. Coulsdon, Surrey. Bred by H. B. D. Kettlewell.

Allotype—♀ (first brood), 28.iv.1947. Same data.

Paratype—♀ (first brood), iv.1947. Same data.

Paratypes (second brood)—♂, 17.vii.1947; ♂, 19.vii.1947; ♀, 14.vii.1947; ♀, 17.vii.1947. Coulsdon, Surrey. Bred by E. A. Cockayne.

Paratypes (third brood)—♂, 20.viii.1947; ♂, 25.viii.1947; ♀, 21.viii.1947; ♀, 25.viii.1947. Coulsdon, Surrey. Bred by E. A. Cockayne.

EXPLANATION OF PLATE.

- Fig. 1. *Selenia tetralunaria*, ab. *nigrescens*. Type—♂. First brood.
 Fig. 2. *Selenia tetralunaria*, ab. *nigrescens*. Allotype—♀. First brood.
 Fig. 3. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♂. Second brood.
 Fig. 4. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♀. Second brood.
 Fig. 5. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♂. Third brood.
 Fig. 6. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♀. Third brood.
 Fig. 7. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♀, under side. Third brood.
 Fig. 8. *Selenia tetralunaria*, ab. *nigrescens*. Paratype—♀. Third brood.
 Fig. 9. *Selenia tetralunaria*. ♂, normal. First brood.
 Fig. 10. *Selenia tetralunaria*. ♀, normal. First brood.
 Fig. 11. Hybrid *parvitunaria* (*S. bilunaria* ♂ × *S. tetralunaria* ♀ heterozygote). ♂. Autumn brood.
 Fig. 12. Hybrid *parvitunaria* (*S. bilunaria* ♂ × *S. tetralunaria* ♀ heterozygote). ♂. Spring brood.

In the two normal specimens the darker areas appear much darker than they should appear.

"A PEOPLE NOT STRONG."

By HORACE DONISTHORPE.

Recently my friend Dr Malcolm Burr, the eminent Orthopterist, sent me an article on ants, with the above heading, cut out of the June number of *Blackwood's Magazine*, pp. 417-25.

It is on ants in general; the Giant Pangolin, an ant eater; and other interesting matters. The article is written in a very pleasing and knowledgable style, and were it not published under the name "John Welman," I should have credited the authorship to Malcolm Burr. As I am ignorant enough not to know the name of John Welman, it may possibly be a "nom de plume"!

The article in question shows a considerable knowledge of ants, and is, in the main, quite correct as to their habits. There are, however, two grave mistakes which, as the French say, "strikes one to the eye." to a myrmecologist.

The one is, when discussing some red ants it is stated—but perhaps it were better to quote the passage intact—"On the edge of a bunch of leaves, sewn neatly together with silk and level with my nose, a row of bright-red furies pranced on their hindlegs, waved their forelegs, and literally quivered with rage. Their united wrath made the whole nest tremble . . . One has only to touch the twig with one's finger to be most certainly stung. They are their own watch-dogs, these clever ones, who use their babies as shuttles to stitch together their homes."

The ants thus described are, of course, species of *Oecophylla*, and this is just how they behave when disturbed; with the exception that they do not sting! The tribe *Oecophyllai* belongs to the subfamily *Formicinae*, and none of them possess stings!

The second is when discussing some "ants' nest beetles":—"The ants would fawn on them till they brought forth their young, who then would slay the ants' own children. Those insinuating beetles carried with them no sacred immanence; their bright behinds exuded only sweetness, and were being licked and kissed." Ants, it is true, do obtain a sweet secretion, which is excreted from the anus, and not the cornicules as is sometimes stated, of Aphides, or Plant Lice; but not from beetles. The beetles, referred to in this paper, belong to the genera *Atemeles* and *Lomechusa*, and they possess yellow trichomes which are situated on the sides of the abdomen, which cover glands that excrete a sweet secretion, and it is these trichomes which the ants lick, and not the posterior part of the body.—Entomological Department, British Museum (Nat. Hist.), Cromwell Road, S.W.7.

**BUTTERFLY COLLECTING IN WOOD WALTON, HUNTS., AREA,
AND THE CHILTERN HILLS, DURING 1948.**

By H. A. LEEDS.

It seems best to recall that 1948 was preceded, in 1947, by a year which in its winter months had an extremely long period of snow and frost culminating with disastrous floods, afterwards producing an exces-

sively hot summer succeeded by drought and water shortage until its termination.

In 1948, January alleviated the drought with a rainfall of more than 5 inches which included 2 inches of snow on 20th, and about the same depth fell on 22nd February.

Frosts were infrequent and 6 consecutive days, 17th-22nd February, was the longest period; two white frosts on 12th and 16th April somewhat affected plums, but they and apples yielded fair crops.

The corn harvest commenced at the end of July, but strong winds with rain and hail entangled the crops sown early in the year, causing deterioration and loss of grain. Reaping machines in such cases caused greater loss than cutting with scythes and in a field near Abbots Ripton no less than 14 men were so employed. Even in my young days, when scythes were in full use, nine men in one large field was the maximum. In Hunts., and many counties, carting was not completed until early October owing to the frequent showers. Flooding was confined to the east-side border counties of England and Scotland where houses were inundated, road and railway bridges demolished, and several thousand acres of nearly ripe corn destroyed. Despite the losses the over-all quantity of grain suitable for milling was estimated to reach an average production, which is more than can be generally stated for the butterflies this summer.

March recording of 180 hours' sun was nearly 60 above average, and rainfall of 0.68 was about an inch below average. The hottest March day for a century was on 9th, when, with a shade reading of well over 70° Fahr., I toured Monk's Wood in bright sunshine, but the only hibernated butterfly seen was an *io*. Further hot weather induced *ramni* and *urticae* to appear on 12th, and on 25th 11 *urticae*, 6 *io*, and 2 males and a female *ramni* were noted. Although reported in the neighbourhood, I saw no *c-album* until the first brood began to emerge on 25th June.

April possibly had less rain and more sun than average. May had several warm and sunny days until 23rd, when rain all day and into the next morning began the long period of unsettled and cool weather which with few sunny days extended through the summer. In autumn there was much improvement and many sunny days, but it lacked the 1947 plentiful assortment of butterflies, and their season closed with some sharp frosts and much fog (22nd-30th November).

27th March—Blackthorns in full bloom, whitethorns full of leafage, 33 days earlier than in 1947. Several plum and pear trees well flowered.

25th April—Blossoms of may in patches, then widespread on 29th, when Horse-chestnut trees were fully flowered, 17 days earlier than in 1947.

11th May—A *cardui* late in the evening was taking short flights between two trees and the ground; eventually it rested on a trunk beneath a branch and doubtless slept there. Some years ago I saw 7 of them arrive and choose a similar position, near each other, on a large oak in a hedgerow during dusk in the spring, at Wood Walton. On 12th June two others were flying in the afternoon.

8th June—One *atalanta*, and another on 14th.

The *M. stellatarum* moth was not seen during the year.

Appended are first appearance dates in Hunts; with scarcity, etc., remarks.

11th April—*C. argiolus*, common in first brood, but only one later; *P. rapae*, not more than 6 on any day in spring, and 12 later; *Heodes* (*Lycaena*) *phlaeas*, scanty, see later remarks in text. 15th—*P. brassicae*, scarce, not exceeding 4 on any day (on 22nd November several various sized larvae were feeding on some cabbages); *P. napi*, rather scanty. 25th—*E. cardamines*, fairly common.

9th May—The only *C. rubi* seen. 15th—*A. euphrosyne*, plentiful; *P. malvae*, very scarce. 17th—*E. tages* and *A. agestis*, both scarce. 18th—*C. pamphilus* (at no time numerous but emerged almost continuously until late October); *P. icarus*, at a very low ebb and 12 in first brood and 19 in second were most seen in a day. 21st—*P. megera*, both broods limited.

12th June—*O. venata*, uncommon; *S. pruni*, bad weather restricted observation and not more than 12 seen at any visit to Monk's Wood. 25th—*M. jurtina*, plentiful, none bleached; *P. c-album*, several widespread in both broods.

2nd July—*M. galathea*, grass-verges cut for hay before emergence, several seen fresh out but soon went away. 5th—*A. urticae*, see later remarks in text. 6th—*A. paphia*, fairly common; *L. camilla*, only 2 males and 1 female seen during several walks in Monk's Wood, this was disappointing after their 1947 increase; *A. hyperantus*, scores emerged that day when the sun shone after a misty morning. 20th—*M. tithonus* and *T. sylvestris*, both less than usual; *P. aegeria*, two, not seen earlier (a few later up to 20th October). 23rd—*T. quercus*, one flying high around a roadside oak and no more seen during special searches of oak, aspen and ash. 28th—*T. lineola*, scarce. 29th—A female *T. betulae*, no other seen. 31st—*N. io*, 2 then and not more than 2 in one day afterwards; *V. atalanta*, 2 then (maximum 7 on 9th September).

5th August—*G. rhamni*, uncommon (2 males and a female on 24th October finished their latest appearance).

6th September—*V. cardui*, 1 perfect and another worn and torn near each other, afterwards only 1 more, a perfect female taken on 30th. 9th—The only *C. croceus* seen, a large fresh female caught in a field of potatoes.

A. cydippe is usually fairly common in Monk's Wood, but this year I looked for it in vain there, but heard that it and *A. aglaia* were seen near the Reserve in Wood Walton Fen.

The Chiltern Hills' fortnight commenced on 21st August and rain began just after my mid-day arrival at Askett, Bucks., and continued until night. Hot sun the next day dried the grass and after an early tea I arrived at Kop Hill and found Messrs G. B. and G. H. B. Oliver there, but on the point of leaving. G. B. stated, "You will find plenty of crippled *coridon*," and I did, especially so in *obsoleta* forms, and a male ab. *caeca* was too crumpled to keep. Emergence was common

until dusk and as they much outnumbered those worn, it seemed to be the largest hatch of the season, nothing like it occurred later. A few aberrations were kept that evening.

A sunless and violent windy day on 23rd and pouring rain on 24th spoiled the previous *coridon*, etc. Then 8 fine warm and mainly sunny days in succession were fully used for touring and I found *coridon* very scarce in Oxon, except at Chinnor; the Cement Works there have evidently used the Icknield Way for transport and a bare chalky surface extends for quite half-a-mile westwards, where it is tunnelled beneath and excavation of chalk from the hillside has commenced. Beyond this the Icknield Way was beautifully flowery, but butterflies almost absent along it and when I reached Kingston Crossing railway halt only 4 *icarus*, and 3 *aegeria* near a bunch of trees, had been seen.

In Bucks., *coridon* was fairly plentiful and I am doubtful if many had appeared earlier in Oxon. In both counties a few ordinary *bell-argus* were seen in nearly every suitable place, but the quantity of *icarus* was meagre, and evidently they have not yet populated favourably the large field near Pulpit Hill where the larval food-plant, *Lotus corniculatus*, abounds, and plenty of high grass stems can provide resting accommodation. I found not more than a dozen settled there one evening.

Other butterflies were rare, even the *Pierids*, and I only noticed, in total, 6 *io*, 5 *urticae*, 1 *atalanta*, 1 *c-album* and 7 *phlaeas*. The few *jurtina*, *megera*, *agestis*, etc., were not counted. Collecting there finished at dusk on 1st September, as the 2nd and 3rd were wet, and I returned home on 4th.

Possibly *urticae* increased later in the Chilterns, as, after being equally rare in Hunts., 25 were seen at Wood Walton on 13th September; 32, 19th; 41, 25th; 44, 26th; 64, 30th. In October, 59, 2nd; 56, 8th; 67, 9th; then flowers and counts of *urticae* diminished, but sunny days enticed odd ones to take a flight in November. Aberrations were absent until 2nd October, when I took ab. *connexa*, Btlr.; eight intermediate to it were feeding on the same row of dahlia flowers and consisted of ab. *polaris*, Staud., and ab. *nubilata*, Raynor; a selected one of each form was taken. On 9th October another *connexa*, uncaught, appeared in this evidently local brood.

A scratched and slightly torn hibernated *urticae* frequented the garden prior to the first brood appearing on 5th July, and was so lively on 30th that it sported with a *c-album* at intervals; 10 other fresh *urticae*, near by, were not interested in gambolling. This showed that a 1947 *urticae* saw some of the 1948 next generation, but lack of proof of offspring or relationship. It was not seen after 30th July, and I wondered whether it had found a mate?

H. phlaeas. The abundance of this species during the latter part of the 1947 hot season animated early and continued observation in 1948. The winter had been mild and although early spring appeared to be favourable only 2 were seen in April and none in May.

On 11th April the first one had just settled in a sheltered and sunny wide corner of a grass-verge when a very large Humble-bee flew near it; *phlaeas* darted at the bee, which was so much disconcerted as to turn away and, mounting higher, it made clumsy, and fallacious, turns as

phlaeas continued its rapid darting annoyances from either side until a tree, quite 20 yards away, hid them from sight. Many times I have seen 2 *phlaeas* indulging in similarity of rapid zigzag movements in flight, but this prolonged recreation with a huge bee was novel to me.

Solitary *phlaeas* were seen on 11th and 18th April, 12th and 25th June, and 26th July; then 7 in the Chilterns, 22nd-31st August; and afterwards in Hunts, September 6th, 5; 9th, 8; 14th, 2; October 9th, 1. Total, 28, all ordinary. The environment of their 1947 best place remained unchanged in 1948, but only once could I find any there, viz., 7 on 9th September; on the 14th they were gone and none appeared there later although watched.

In Hunts, aberrations were so scarce that apart from the 3 *urticae* previously mentioned I can only add: *P. c-album*, male upper, post-transversa. *A. hyperantus*, female under, postcaeca, white spots unringed on hindwings.

In the Chilterns:—*P. megera*, female upper, with large pale-straw patches bleaching part of the fulvous colour and 3 of the 4 submedian spots, alike on both hindwings = post-partimtransformis.

P. icarus. Female unders, arcuata; antitransiens; antidiscoelongata.

P. (L.) coridon. Male uppers, caeruleo-cincta; ultracaeruleo; marginata; major.

Male unders, I-nigrum; I-nigrum-arcuata, and a *sinis* only of that form is devoid of the left hindwing; costajuncta, which is rare individually; the following 5 are somewhat deformed, 3 obsoleta; antisinis-caeca; postdex-caeca. Female unders, antialbescens-postfulvescens; pulla; flavescens; apicoextensa; arcuata; 2 basijuncta. Confluentiae forms only yielded arcuata-semibasijuncta; 3 obsoleta, slightly deformed; caeca.

The female uppersides were exceptionally poor in quality; a fat *semisyngrapha* was picked up on Pulpit Hill and released, no others had more than a few blue scales.

As a diversion from collecting, Mr G. B. Oliver kindly fetched me from Askett in his car and I spent an afternoon and evening at Hazlemere, Bucks., looking through his surprisingly rich collection of aberrations of many British species of butterflies which he had caught, bred and bought. Among them I recognized the *coridon* ab: *ultraradiata*, male underside, which is depicted, plate 17, fig. 22, in the "Monograph of *coridon*"; he gave £22 for it at an auction sale. His son, G. H. B. Oliver, shares the residence, and has a separate collection, but there was only time to scan part of it before my departure and mainly to notice some very good aberrations of *coridon* and *bellargus* caught by himself in previous years.

When returning along the High Wycombe and Princes Risborough road, it was deplorable to see that cultivation had completely destroyed collecting on the lengthy stretch of chalky hillsides from Bradenham to Saunderton; formerly they were grassy and flowery undulating slopes well inhabited by *coridon*, *icarus*, *agestis* and several other butterflies. Cattle and horses used to graze thereon.

COLLECTING NOTES.

THE PIGMENT OF ORTHOPTERA.—Some interesting work, of course of a very technical nature, on the pigment of the coloured wings of the *Oedipodidae* has been done by Salâhattin Okay, of the Institute of Zoology of the University of Ankara.

In one paper, in French, entitled " Contribution à l'étude du pigment vert chez les Insectes " (*Rev. Fac. Sci., Univ. Istanbul*, Series B., xii, Fasc. 2, 1946), he discusses the green colour, so common in the Orthoptera, finding it a blend of a blue and a yellow component. He then finds the same thing in certain Rhynchota and also in *Chrysopa perla*.

In a second paper, also in French, he discusses the blue, red and yellow pigment in the wings of the *Oedipodidae*. In each case it is a chromoproteide, " Sur les pigments des ailes postérieures bleues, rouges et jaunes des Acridiens " (*Ibid.*, Fasc. 1).

In a third paper, " Sur le pigment brun des Orthoptères " (*Comm. Fac. Sci. Univ. Ankara*. I. Separatum. 1948) he regards the brown pigment in *M. religiosa*, *A. turrita* and *C. italicus* as an ommatine.—M. B.

EVETRIA PURDEYI, DURRANT, 1911.—On 23.viii.48 I found, inside a window at Angeston Grange, Uley, Glos., a specimen of *Evetria purdeyi*, which I take, but not commonly, in my garden at Rodborough Fort, where it is attached to *Pinus austriaca*. Search at Uley showed its origin in a large *Pinus radiata* (Monterey Pine) from which I was able to beat examples in some numbers on subsequent days. As was to be expected, however, most were taken worn, as it was past the normal date of emergence, which is mid-August or a little earlier.

Evetria purdeyi is probably widely distributed in S. England but is overlooked—or at least seldom recorded. It was described in 1911 from Folkestone and has since been found in the Isle of Wight, to which I have previously added Gloucestershire. It is however, an inconspicuous species which appears late in the season. It is attached to *Pinus austriaca* and *P. sylvestris*, to which is now added *P. radiata*. This latest foodplant hints that it may have been introduced from N. America.—T. BAINBRIGGE FLETCHER, 19.i.49.

MITTEILUNGEN DER SCHWEIZ. ENTOM. GESELLSCHAFT, Vol. xxi, Part 4 (27.xii.1948) contains several articles of interest to us:—Ecological Studies in epigeous* Collembola (pp. 485-515) by H. Gisin, the Sub-

*Epigeous (epi, upon; ge, the earth), living close to the ground.

family Cheiopachinae of the Pteromalidae (pp. 516-530, figs.) by C. Ferrière, *Hesperia (Pyrgus) alveus*, Hb., in Ticino (pp. 531-546, figs.) by G. Kaufmann, the Behaviour of the larvae of *Caenemus indagator* in nests of *Osmia rufa* (pp. 547-554, figs.) by C. Julliard, a Mymarid, *Petiolaria anomala*, found in the Bernese Oberland and also known from the New Forest, Denmark and Breslau (pp. 555-556) by C. Ferrière, and a note on the parasites found at Zinal in pupae of *Vanessa urticae* (pp. 557-565, figs.) by C. Julliard.—T. B. F.

THE OCCURRENCE OF *MELITAEA CINXIA* IN HANTS AND DORSET.—I read with interest Mr C. B. Antram's collecting experiences during 1948 and particularly his reference to the occurrence of *M. cinxia* in the Sway area, although, as he writes, "the larvae had been put down recently"—how recent he does not mention—therefore a few additional notes on *M. cinxia* in this district may be of some interest. Since coming to live here in Bournemouth during 1938 I have had the pleasure of meeting this insect from time to time and mostly in single specimens almost every year, and anywhere in the area between the New Forest and Studland, Dorset, where at the latter place I saw a few on the wing near the coast in 1939. It has been seen at Holmsley, New Milton, Highcliff-on-Sea and at Christchurch. Presumably *M. cinxia* had flown over from its locality in the Isle of Wight only a few miles away, but the chance of a small colony existing somewhere in this area did not seem a remote possibility, so it is pleasing to record that I found a small colony of about forty insects near Bournemouth during May last year (1948). They were all in fine condition, having, I believe, bred on the spot and near where I had seen specimens flying in previous years; they were, however, very much restricted to an area of a few yards, and its continued existence will be very precarious indeed. It will probably survive for a time and die out—the usual fate of *M. cinxia* outside its natural habitat. I refrained from taking any specimens in the hope that it may continue to thrive near here. As far as I am aware this new locality is of entirely natural occurrence and has not been "introduced," but in this connection it must be stated that the Sway colony is only some twelve miles away, quite an easy flight for *M. cinxia*.—H. J. TURNER, 33 Pine Avenue, West Southbourne, Bournemouth, 16.1.49.

LEPIDOPTEROUS LARVAE IN GALLS: AN ENQUIRY.—A common tree on the Asiatic side of the Bosphorus is *Pistacia terebinthus*. In the late summer almost every branch carries one or more long pods, like great beans. When cut open, they are found to be hollow and packed with a yellow waxy Aphid.

Looking through Stainton's work on the *Tineina* of Asia Minor, p. 73, I find an allusion to the "unsuccessful attempts of Dr Staudinger to discover the larva of *Stathmopoda guerinii*, which inhabits the long, pod-like galls formed on the twigs of *Pistacia terebinthus* by Aphides."

Much water has flowed down the Bosphorus since Stainton wrote those lines and no doubt precise information is now available, but not to us who are out of reach of the big reference libraries.

If some reader of *The Entomologist's Record* would be kind enough to give me some details, with names, I should be very much obliged, as it is a matter of considerable local interest.

Curiously enough, this species of *Pistacia* is rare on the European side, where I have come across only three small trees. It is replaced by the closely related *P. mutica* which, being far less impregnated with turpentine, does not seem to be attractive to the Aphides.—MALCOLM BURR, P.K. 2198, Istanbul.

PAIRING OF *SCOPEUMA* SPECIES (DIPTERA: CORDILURIDAE).—In October 1948 I took two common Scatophagid flies *in cop.* in my garden, feeling

sure at the time of getting a female that could be correctly named from the male. The pair were later sent to Mr H. Audcent for identification and returned by him as *Scopeuma lutarium*, F. (♂), and *Sc. inquinatum*, Mg. (♀). The question arises as to which is to be regarded as species and which as variety; or are both varieties and of what species? It would, I suggest, be of considerable value both to collectors and to taxonomists if collectors of Diptera would publish records of pairings of what are currently regarded as distinct species.—JAMES EDWARDS, 81 Hassam Parade, Newcastle, Staffs.

CURRENT NOTES.

AN article by d'Almeida on the subsection of the Pierid genus *Appias*, *Glutophrissa*, is for its thoroughness as near perfection as possible. From the figure of the main species *drusilla* of Cramer to the date of the paper, every reference has been given. The same fullness of detail is given to the half-dozen forms which have been named by different authors. Two plates give 12 figures of *drusilla* forms, the pupa and the larva. On another plate are figures of venation, antenna, the 3 legs, two views of the penis and the genitalia. In fact the whole article is a model of completeness and the author is to be congratulated.

It seems ungracious to criticise such a fine piece of work, but a quotation in the article reminds us of an error, *A. drusilla drusilla*, Cramer. Cramer was never responsible for this. Of course, it should be *drusilla*, Cr., which included all possible irregularities (aberrations, etc.) until someone chose a form as the typical. To me the duplication put down to Cramer is a most *obvious error*.

BOLETIM BIOLOGICO is a periodical of Brazil dealing with the Zoology and adopted by the Entomological Society of Brazil as their official organ. It is published at Sao Paulo and contains general natural histories and is concerned with all orders; the economic side of zoological study necessarily kept in view. The series was commenced in 1933, each volume is well supplied with illustrations and diagrams; the paper and printing is of very good class. The completed volume of 1939 consists of nearly 600 pp. of quarto size and is furnished with a very full and informative Index. The well-known entomologist, Romuald Ferreira d'Almeida seems to be the guiding star, at least of the entomological portion, if not of the Journal itself.

THE Ankara University Agricultural Faculty has published a paper on corn pests in Central Anatolia, by Professor Dr Bekir Alkan. This is not a purely entomological work, as it includes Nematodes, Gastropods, birds and mammals, but by far the greater part of the work deals with insects. A general description of each species is given, with a brief account of its occurrence, the damage it does and how it is to be dealt with. Entomological literature in Turkish is still in its infancy and such works as this are very useful to the practical man in a country where agriculture is the most important industry, but zoological knowledge very restricted.—M. B.

IN looking through many magazines from many countries it makes one sorry to see so much space filled with several illustrations of new species very often with no indication of what the insect is like. This "slipshod" work is of practically no use except to one who is a good worker with his microscope, and where there is no other definite description the species should be labelled Genitalia Species. The Nature lover can then by-pass it without further struggle and waste of valuable time.—HY. J. T.

CAPTAIN KENNETH J. HAYWARD, a great friend of my own and a correspondent of the *E.R.* for at least three decades, after many years' sojourn in the Argentine, has been commissioned by the Governors of the great educational establishment at Tucumán, Instituto Miguel Lilla, to obtain material for a projected large work on the zoological and botanical resources of the Republic.

The huge mass of material already collected in the country is now to be compared, collated and identified where necessary with all available material in the vast accumulations at S. Kensington.

From his life's experiences, Captain Hayward is well qualified. His early life was spent in the lovely county of Somerset, which induced a love of Natural Beauty. Later he passed on to Aswan on the Nile, where he was engineer in charge of the huge dam, which gave him opportunities for the study of the limited fauna. From there, broken in health, he spent a season at my suggestion in Cyprus. From thence he went to the Parane River area of N.E. Argentine with an American Company collecting medical supply from the quebrola tree, but still devoting more and more of his energy to the lepidopterous fauna of the Republic.

WE have recently received from Kenneth J. Hayward, of Tucumán, Argentine, three further separates of his articles on Argentine and Neotropical *Hesperiidae* (Act. Zool. Instit. Man. Lilla).

THE "Soc. for British Entomology" has sent out two further articles by E. S. Brown, B.A., F.R.E.S.: (1) a series of Records of the Aquatic Coleoptera of North Wales, and (2) a Contribution towards an Ecological Survey of the Semi-Aquatic Hemiptera-Heteroptera (Water-bugs) of the British Isles, dealing chiefly with the Scottish Highlands and East and South England. His own personal records for many years past.

THERE are many pairs of species so much alike that the differences cannot be clearly shown by a black and white plate or a description, for instance, *Apatele psi* and *tridens*, and *Hydraecia lucens* and *crinanensis*. They may however be distinguished easily by the genitalia, and in such cases figures of the genitalia are more useful than figures of the imagines. Such species cannot be ignored because they are difficult to recognize, nor is it correct to call them "genitalic species."

REVIEW.

THE SONGS OF INSECTS, by George W. Pierce, Ph.D., Harvard University Press, 1948.

The subtitle explains the scope of this remarkable work, "With related Material on the Production, Propagation, Detection and Measurement of Sonic and Supersonic Vibrations," and its authority cannot be questioned, for the author is not an entomologist, but Rumford Professor of Physics, Emeritus, and Gordon McKay Professor Communication Engineering, Emeritus, Harvard University.

With the exception of twenty pages on the sounds produced by Cicadas, birds and bats (with an astonishing stroboscopic photograph of a bat in flight), the work is devoted to the stridulation of the Orthoptera and, although so highly technical that the greater part can be appreciated only by a physicist, the balance is of unusual interest to entomologists in general and to orthopterists in particular. The upper limit of audibility for the human ear is a frequency of about 18,000 vibrations per second. While the frequency of *Gryllus assimilis* (closely resembling *G. campestris*) in its common song is 4900 vibrations, in its love song it rises to 17,000; with *Gryllulus domesticus* the frequency is respectively 3800 and 24,000, but in the *Tettigoniidae* he records 56,000 for *Conocephalus spartina*, and in the exotic-looking *Pterophyllus camelifolia*, with its enormous elytra, as high as 63,000. Many of these insects, perhaps all, can vary their song with their emotion and it is not too fanciful to look upon it as an elementary form of language.

An interesting taxonomic point is made in the case of *Nemobius fasciatus*, of which there are three subspecies; these are morphologically barely distinguishable, but the songs are entirely distinct. Incidentally, interesting particulars are given of the courtship of these insects, including a photograph of the act of mating of *Oecanthus*, with the female mounted upon the male, nibbling his alluring discharge from the metanotal gland. Incidentally, American entomologists have succumbed to the charm of the song of *Oecanthus*, represented in the south of Europe by the cricket of the vines, *O. pellucens*, whose lovely lilt I love to listen to on warm autumn evenings, to the accompaniment of the curious whistle of the Scops' owl and the illumination of the fireflies. Burroughs describes the sound as a "purring," and Thoreau as a "slumberous breathing" and "inner dream," while Hawthorne describes it as an "audible stillness" and declared "if moonlight could be heard, it would sound like that."

The book is profusely illustrated by photographs of the insects, of their musical apparatus, of records of their songs and of the complex and delicate apparatus employed. Outstanding is the coloured frontispiece, of a full-face view of the black-horned *Oecanthus* with his lovely elytra raised in the act of chirping.

M. B.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge.

They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

Wanted—*A. vestilialis* from all parts of the British coasts except south: also *R. simulans* and *S. ravida* (*obscura*). Cash or exchange.—A. H. Sperring, Slindon, Fifth Avenue, Warblington, Havant, Hants.

Desiderata—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.

Wanted.—I need specimens of *Lycaena* (*Heodes*) *phlaeas* from all parts of the world, particularly Scandinavia, Russia, Siberia, Madeira, Canaries, N. Africa, Middle East counties, and E. Africa; also varieties from British Isles or elsewhere. I will purchase these, or offer in exchange good vars. of British Lepidoptera or many sorts of foreign and exotic Lepidoptera.—P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.

Wanted.—For the British Museum larval collection, larvae of Chrysomelid beetles, alive or preserved. Liberal exchange if required.—Dr S. Maulik, British Museum (Natural History), Cromwell Road, London, S.W.7.

Wanted to Purchase—Pupae in any quantity of any species of moths.—R. M. Rickard, Contingsby, Lincoln.

Wanted to Purchase—*The Entomologist*, Vols. 1-78 (1840-1945).—J. M. Chalmers Hunt, 70 Chestnut Avenue, West Wickham, Kent.

Wanted to Purchase—African Section of Seltz' *Macrolepidoptera of the World*, both Butterfly and Moth Volumes, either bound or in parts.—D. G. Sevastopulo, c/o Ralli Brothers Ltd., P.O. Private Bag, Mombasa, Kenya Colony.

Wanted—Distribution Records, Notes on Abundance and Information regarding Local Lists of the Dipterous Families Empididae and Conopidae.—Kenneth G. V. Smith, "Antiope," 38 Barrow Street, Much Wenlock, Salop.

Wanted to Purchase—Leech's British Pyrales. Coloured Plate Edition.—A. W. Richards, Nether Edge, Hawley, near Camberley.

Wanted—Set or in papers, Scotch and Northern England forms of the British butterflies; specially *Coen. typhon*, *Erebia epiphron*, *Lycaena artaxerxes*, and *Lycaena salmacis*. Purchase or in exchange for Southern forms of many species.—Chas. B. Antram, F.R.E.S., Clay Copse, Sway, Lymington, Hants.

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MEETINGS OF SOCIETIES.

Royal Entomological Society of London, 41 Queen's Gate, S.W.7: March 2nd, April 6th, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Friday in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

TO OUR READERS.

Short Collecting Notes and Current Notes. Please, Early.—Eds.

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Change of Address:—The temporary address of Mr Kenneth J. Hayward of Tucuman will be, as from September, c/o Dept. of Entomology, British Museum of Natural History, London, S.W.7.

Communications received:—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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THE AMATEUR ENTOMOLOGISTS' SOCIETY'S ANNUAL EXHIBITION

will be held on SATURDAY, 26th March, at the BUCKINGHAM GATE CENTRAL SCHOOLS, Wilfred Street, London, S.W.1 (near Victoria Station), from 2 to 5 p.m.

Visitors will be welcome.

LXI.



ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

MALCOLM BURR, D.Sc., F.R.E.S.
E. A. COCKAYNE, M.A., F.R.C.P., F.R.E.S.
J. E. COLLIN, J.P., F.R.E.S.
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T. BAINBRIGGE FLETCHER, F.N., F.L.S., F.Z.S., F.R.E.S. (*Sub-Editor*),
"Rodborough Fort," Stroud, Glos.

HY. J. TURNER, F.R.E.S., F.R.H.S. (*Editorial Secretary*).

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HEODES PHLAEAS.

T. D. F.

VARIATION IN REARED HEODES (LYCAENA) PHLAEAS.

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By T. D. FEARNEHOUGH.

Plate II.

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For several years large batches of *phlaeas* have been reared with a view to forming a series covering the variation range of this species. The batches reared from ova obtained from wild typical females of both Spring and Summer flights, and in one instance (1947) from females of a third (October) emergence. All the females used for egg laying were collected from a colony which has shown tendencies to variation. The locality of this colony is artificial in that it consists of a deep hollow of small extent formed by the mountainous dumps of a South Yorkshire coal mine. The Small Copper has inhabited this restricted locality in good strength for some years, and has been happy in having an abundant growth of sorrel, plenty of flowering weeds, and unusually good shelter from prevailing winds. Unfortunately, the locality is likely to disappear in the near future and be buried under the steadily encroaching grey mountains of colliery waste.

In the years before 1948 my rearing efforts had normal success and produced a number of varieties which might be regarded as fair reward. I estimate the proportion of major varieties obtained at rather less than one per cent. of the total specimens reared. The best stroke of luck was in 1946, when seven specimens of *ab. radiata* were reared from one batch. During the past season (1948) a special effort was made at mass rearing of *phlaeas*, and it is the extraordinary crop of colour forms obtained which has induced me to prepare this account.

My objective was to rear from 1000 ova, and I made preparations by planting clumps of sorrel in my garden in the Autumn of 1947. The foodplant was encouraged by suitable applications of phosphate, potash, and nitrogenous material. The flowering stems were cut away as they appeared and thus when the *phlaeas* larvae were obtained a large supply of luscious food was at hand.

The first emergence of *phlaeas* in early June was missed owing to my absence from home at the critical time, but opportunity came during August bank holiday week, when the second brood appeared in strength. Fourteen typical females were captured and these deposited ova with great enthusiasm. Each day fresh leaves were supplied and the old leaves with their egg deposits removed. When 1000 ova had been counted the females, which were all still alive, were liberated. It was later found that a miscount had occurred and actually 900 ova were obtained, of which about 850 hatched. The feeding of this quantity of larvae proved to be a herculean task and occupied all leisure time for some weeks. Eventually over 400 pupae were obtained and most of these produced perfect insects during October.

COLOUR VARIATION.

The remarkable series of colour freaks produced was the main feature of this rearing effort. Twenty-three colour varieties were obtained, and, although no two are alike, the specimens can be arranged in four groups as follows:—

- (i) Having both forewings of creamy shade and hindwings normal. Four specimens.
- (ii) Having one forewing creamy or silvery and the other wings normal. Five specimens.
- (iii) Having both forewings and hindwings shaded with cream or gold. Two specimens.
- (iv) Having both forewings variously marked with cream or gold. Twelve specimens.

Two further varieties of a different type having the copper colour replaced by a rather dull yellow were obtained. Only one specimen from the whole batch had the dusky ground colour of *ab. suffusa*. It is interesting to note that among the many hundreds of *phlaeas* reared in previous years from the same locality only two specimens with pale streaks on the forewings have occurred.

SPOTTING VARIATION.

In none of the specimens reared from this batch of 400 pupae was there spotting variation of extreme type. Since the pupal stage had coincided with rather cool weather conditions, the specimens were generally of the so-called Spring form, having small upperside spots on the forewings and clear copper ground colour. Several specimens had some obsolescence of the lower spots on the forewings, the most extreme example having only four spots remaining of the outer series on each wing.

SIZE VARIATION.

In large scale rearing of butterflies under good conditions the range in size variation is usually surprisingly narrow, but rearing under adverse conditions often produces undersized and dwarf specimens. In the present rearing experiment the larvae responded to the specially grown food and the resulting butterflies were mostly of good size. Several abnormally large specimens occurred, and the largest of these measured 37 mm. Four other specimens exceeded 35 mm. in expanse, and quite a number would qualify for Tutt's arbitrary specification of 32 mm. for *ab. major*.

Small specimens are less worthy of notice, but one tiny example occurred which had a wing expanse of only 21 mm. Only about twenty small coppers from the whole batch were smaller than 26 mm., and of these I preserved half-a-dozen which, in addition to their smallness, showed other variation features.

PLATE.

It is difficult to illustrate without colour the variations in such a brilliant butterfly, but an attempt has been made to show, in the accompanying photograph, the aberrational features of a few specimens. With the exception of the insect of Fig. 3, all the specimens appeared in the rearing effort described above. A descriptive key to the plate is given below.

- Fig. 1. Forewings of a creamy-gold colour, hindwings normal. Emerged 1.10.48.
Fig. 2. Similar to (1) with obsolescence of lower forewing spots. Emerged 7.10.48.

- Fig. 3. Having left forewing creamy-white, other wings normal. Captured Loxley 21.8.48. Recorded *Ent. Record*, 1948.
- Fig. 4. Similar to (3). Emerged 7.10.48.
- Fig. 5. Asymmetrically streaked forewings, copper and creamy-gold. Emerged 2.10.48.
- Fig. 6. Forewings pale-coppery with lighter patches. Partial obsolescence of spotting on upperside. In this and in (2), underside spotting is showing through. Emerged 2.10.48.
- Fig. 7. Large specimen, 37 mm., of normal colour but rather paler towards the base. This is exaggerated in the photograph owing to the metallic sheen at this position. Emerged 21.10.48.
- Fig. 8. Tiny specimen of uniform yellowish-coppery tint. The spotting shows unusual arrangement. Emerged 27.10.48.
- Fig. 9. Small specimen of creamy-coppery tint, having the normally black borders of grey shade. Emerged 10.10.48.
- Fig. 10. Showing asymmetrical pale areas in the copper ground of the forewings. Hindwings of normal colouring but "tailed." Emerged 1.10.48.
- Fig. 11. Broad coppery-red band on hindwings. Forewings coppery at the base shading symmetrically to creamy tint at the outer margin. Emerged 14.10.48.
- Fig. 12. Forewings yellowish, right wing rather paler than left. Emerged 11.10.48.

ENTOMOLOGICAL NOTES FROM EAST TYRONE, 1948.

By T. GREER, Cookstown. Co. Tyrone.

The Spring in this district was fairly early after a mild winter. During the year migrant lepidoptera were conspicuous by their almost complete absence; only one *Vanessa cardui* and two *V. atalanta* were observed, compared with dozens of both species during the autumn of 1947. *Erannis marginaria* came to light on 27th February, an early date for this locality; followed by *Orthosia munda* on 16th March; the first *Aglais urticae* was observed on 13th March, when some early salwos were commencing to bloom. These produced later: *O. gracilis*, *O. incerta* and hibernated *Xylena vetusta*, var. *brunnea*. *Pararge aegeria* was on the wing in a sheltered spot on 14th April, and four *Pieris napi* were observed in a small wood the next day, followed by *Euchloë cardamines* on the 17th, and *Incurvaria muscalella* and *Oidaematophorus monodactylus* were beaten out.

The following came to light on 26th April: *Ectropis crepuscularia*, *Lampropteryx suffumata*, *Nothopteryx carpinata*, *Caenoteaphria derivata*, *Xanthorhoe ferrugata*, *Eupithecia tenuiata*, *Gymnoscelis pumilata*, and *Hydriomena ruberata*.

Again on 4th May *H. ruberata* was the most common species at light, quite outnumbering *E. badiata*, which is usually the most numerous at light here in the spring.

On 5th May *Saturnia pavonia* females emerged and attracted several males; *Spilosoma lubricipeda*, *Gonodontis bidentata*, *Cynia mendica*, race *rustica*, and many *H. ruberata* came to the lamp on 13th May. Light on 19th May still produced *H. ruberata* as well as the dark form of *Rusina umbratica*. On 20th May *Dyseia fagaria* were seen flying over heather in the evening, and *Ortholitha scotica* disturbed from gorse.

On a small sheltered bog near the town of Pomeroy on 21st May, a fine warm day, *Callophrys rubi* were flying in numbers about the birch trees and feeding on the flowers of *Vaccinium Myrtillus*, the foodplant here of the larva.

At the end of the month *Pterostoma palpina*, and numbers of *C. mendica*, race *rustica*, emerged from local pupae; in the latest edition of South's *Moths of the British Isles* the distribution given (as far as Ireland is concerned) is still the same as in the first edition, 1907, viz., six Irish counties, to which can be added Armagh, Londonderry, and Tyrone.

Early in June *Laothoe populi*, a pink suffused form, *Cerura vinula* and *Pheosia tremula* appeared in the breeding cage. On 14th June *Procris statice* was abundant in a damp meadow; several of these were of the rare blue-green form.

(To be continued.)

COLLECTING NOTES.

ONCODES PALLIPES, LATREILLE (DIPT.).—There are three species of Cyrtidae recorded for Britain, and the one mentioned above appears to be least frequently recorded. I am indebted to Mr F. Buck who recently gave me two specimens which he took in Epping Forest on 12th July 1948. My thanks are also due to Mr Coe, of the British Museum, who verified the name. Occasionally this fly has been met with in numbers, and it has been observed walking about on spider webs. As the larvae of all three species are internal parasites on spiders, no doubt the ova are laid either in spider webs or in close proximity thereto. Possibly the yellow rings round the abdomen cause the spiders to keep away from them, thinking they are a species of wasp. A good description of the species, illustrated with photographs, is to be found in an article written by Mr H. W. Andrews which appeared in the *Proceedings of the South London Ent. and Nat. Hist. Society* for 1938-9, pp. 77-79.—S. WAKELY, 38 Stradella Road, Herne Hill, London, S.E.24.

LIZARDS IN ANTS' NESTS.—On 30th January 1949 Mr McKenny Hughes found a specimen of the Common Lizard (*Lacerta vivipara*) in a nest of the little yellow ant (*Acanthomyops (Chthonolasius) flavus*, F.) in his orchard, near Cirencester. This is of considerable interest and deserves to be recorded. As mentioned in the *Guests of British Ants* (1927, p. 223) *Amphisbaena*, a blind snake-like lizard, lives in the nests of the leaf-cutting ants on the Amazons. In Guiana, a legless lizard, *Coeccilia annulosa*, also lives in the nests of the fungus-growing ants. Several species of snakes live with ants in Australia, and I also give a number of instances of the "Slow worm" (*Anguis fragilis*, L.) being found in the nest of ants. The ants do not appear to harm the reptiles, and the latter, when hungry, no doubt would feed on the ants and their brood.—HORACE DONISTHORPE, 7.2.49.

CURRENT NOTES.

MEATHOP MOSS NATURE RESERVE.—For some years Meathop Moss in South Westmorland has been run as a Nature Reserve by the Society for the Promotion of Nature Reserves. Recently the Society has leased most of Catcrag Moss—an area of mossland continuous with Meathop Moss. Ecologically the two mosses are a unit. Entomologists and others wishing to visit the Reserve are required to obtain a permit. Applications for these should be sent to the undersigned, and should state the date of the proposed visit.

At the present time the extensive and unique mosslands of North Lancashire and South Westmorland are suffering severely from the inroads of the peat-cutters. These activities completely destroy the peculiar flora and fauna of the areas concerned. It may not be long before the special characteristics of these areas follow the fenlands of East Anglia to extinction. Before this happens, if it unhappily should, a full record of the fauna and flora of the area is desirable. With this end in view I should be grateful to receive any records of insects that readers may have from this area. Especially desirable are records of orders other than Lepidoptera.—(DR) NEVILLE L. BIRKETT (Hon. Sec., Meathop Moss Management Committee), 3 Thorny Hills, Kendal, Westmorland.

HAMPSTEAD HEATH SURVEY: RECORDERS WANTED.—The Natural History and Local Records Section of the Hampstead Scientific Society is carrying out a complete survey of the Heath with a view to a publication on the subject. Anyone who has interest in any particular branch of Natural History and who is prepared to work with the Society, if only for an occasional day, is asked to get in touch with the Hon. Organising Secretary, John Hillaby, 1 Tanza Road, N.W.3 (Hampstead 4626). Check lists from the last publication are available; naturalists who are resident in or who visit the area regularly will be particularly welcome.

In order to keep the magazine going financially at the pre-war price of 10s, it is necessary for all subscribers to pay as promptly as possible. Subscriptions are due in advance—in January of each year—but if I get them in the first three months of the year I am content.

I am always prepared to send a Banker's Order Payment Form, payable—at the option of the subscriber—on 1st January, February, or March. I would urge more subscribers to adopt this method of payment, which not only saves me as Treasurer time in sending receipts, payment reminders, etc., but also relieves the subscriber of the trouble of recollecting to send his subscription personally.—H. W. ANDREWS, Hon. Treasurer.

THE Annual Report of the American Smithsonian Institution for 1947 has been distributed. There are, as usual, a number of reports on biological matters, but between "The Senses of Bats" and "The Mimicry Centres of Civilization," there is only one entomological paper, "Mosquito Control from the Arctic to the Tropics."

THE Spanish *Eos*, vol. xxiv, No. 2, June 1947. This magazine seems to have attained a strong position among many entomologists, providing useful records of their work and observations in "the other orders" so long neglected in Spain. Most of these articles are well illustrated with text figures.

AN article by R. Agenjo on the rearing of a second generation of the ♀ of the Geometer *Adalbestio castiliaria* is in much detail. It is illustrated with 2 plates and a map; 9 specimens are figured, with the wing venation and the genitalia.

THE *Bull. Soc. Ent. France*, 9-10, 1949, contains articles on the Psychidae, the Chalcididae of the Belgian Congo, the Reduviidae of Madagascar, the early stages of the Geometer *Epidda stigma*, with a page of figures, pupae, channels in twigs of food-plants, larvae, etc.; figure of a rare and beautiful *Dielis* (*Pieris*) from New Caledonia; and many short notes.

THE *Revista*, part 3, vol. xiv, October 1948, contains an account of the Metamorphoses of the Geometer, *Chloropteryx munda*, by F. Bourquin. It is illustrated by a page of figures, imago, larva, and details.

THE *Aarnalen* of the great Natural History Museum of Vienna has distributed six large volumes containing the full record of the work during the period from 1939 to 1944. Vol. 550 (1939) consists of over 700 pages with many text figures and maps and 23 plates. The articles deal with groups of species mostly related to the Vienna area and its environs. There are fifteen memoirs; Diptera, Coleoptera, Hymenoptera, a botanical expedition to Iran; Geology, etc.

I HAD an article sent me from an unknown correspondent dealing with the French Alps. This I posted to a colleague, with the accompanying letter. It never reached him. I believe it came from Ottershaw. I had intended it for March. It was very suitable.—HY. J. T.

CURIOUS.—Frohawk's folio work of 2 volumes, *British Butterflies*, published some years ago, was priced at 6 guineas. It was a failure, and finally disposed of at 33s. To-day a copy is for sale in a Catalogue at £7.

I HAVE a fine copy of the beautiful 3-volume work of Drury in the mid-17th century. Does anyone know what became of the collection of Drury? It was for sale. Also I have, presumably in Drury's handwriting, a list of the collection offered for sale with an accompanying letter of his then financial troubles. Both these sheets are Whatman paper of the late 17th century.

A FURTHER part of the *Trans. of the Socy. for Brit. Entomology* has just been published, Pt. 4, Vol. IX, 56 pp. and 2 maps of area of distribution. The article published is by V. H. Chambers, B.Sc., Ph.D., etc., and deals with the Hymenoptera of Bedfordshire. It contains a List of all the recent records, with much biological detail. It is such material as this that forms the basis of our Fauna. We congratulate

late the Society for offering opportunity for recording such scientific work.

THE Amateur Entomological Society will hold their Exhibition on 26th March 1949 at Buckingham Gate Schools, S.W.1, 2-4.45 p.m. During the Exhibition, the following members have kindly offered to give short lectures:—Mr E. E. Syme, F.R.E.S., " Field Crickets "; Mr H. R. Last, F.R.E.S., " Staphylinidae "; Mr L. Parmenter, F.R.E.S., " Diptera." Tea and light refreshments will be available later in the afternoon for those desiring them.

SPECIAL NOTICE.—Will everyone please send all business matter, such as Exchange, Sale, Advertisements, Change of Address, direct to Mr Andrews. To send such to me often means delay.—HY. J. T.

The vacant space in the matter this time is due to the loss while in transit to a colleague, who is a specialist in the matter of the article, "A Recent Collecting Holiday in the French Alps." The late appearance of this month is due to the breaking open of the packet in the post from the printer and the abstraction of the proof sheets leaving the MSS. originals intact.—Hy. J. T.

P.S.—Please send us matter clearly typed, if possible to do so.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

Wanted.—*E. fuscantaria*, ova and imagines. Cash or exchange.—A. H. Sperring, Slindon, Fifth Avenue, Warblington, Havant, Hants.

Desiderata—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.

Wanted.—I need specimens of *Lycaena* (*Heodes*) *phlaeas* from all parts of the world, particularly Scandinavia, Russia, Siberia, Madeira, Canaries, N. Africa, Middle East countries, and E. Africa; also varieties from British Isles or elsewhere. I will purchase these, or offer in exchange good vars. of British Lepidoptera or many sorts of foreign and exotic Lepidoptera.—P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.

Wanted.—For the British Museum larval collection, larvae of Chrysomellid beetles, alive or preserved. Liberal exchange if required.—Dr S. Maulik, British Museum (Natural History), Cromwell Road, London, S.W.7.

Wanted to Purchase—Pupae in any quantity of any species of moths.—R. M. Rickard, Coningsby, Lincoln.

Wanted to Purchase—*The Entomologist*, Vols. 1-78 (1840-1945).—J. M. Chalmers Hunt, 70 Chestnut Avenue, West Wickham, Kent.

Wanted to Purchase—African Section of Seitz' *Macrolepidoptera of the World*, both Butterfly and Moth Volumes, either bound or in parts.—D. G. Sevastopulo, c/o Ralli Brothers Ltd., P.O. Box 401, Kampala, Uganda.

Wanted—Distribution Records, Notes on Abundance and Information regarding Local Lists of the Dipterous Families Empididae and Conopidae.—Kenneth G. V. Smith, "Antiope," 38 Barrow Street, Much Wenlock, Salop.

Wanted to Purchase—Leech's British Pyrales. Coloured Plate Edition.—A. W. Richards, Nether Edge, Hawley, near Camberley.

Wanted—Set or in papers, Scotch and Northern England forms of the British butterflies; specially *Coen. typhon*, *Erebia epiphron*, *Lycaena artaxerxes*, and *Lycaena salmactis*. Purchase or in exchange for Southern forms of many species.—Chas. B. Antram, F.R.E.S., Clay Copse, Sway, Lymington, Hants.

Wanted.—Specimens of *Velia currens* Fabr. (Hemiptera), in any condition, from all parts of the British Isles or Western Europe, especially from the more remote parts of the west and north, for taxonomic study.—E. S. Brown, Hatley Lodge, Hertford Heath, Hertford.

Wanted.—Notes of fluctuations in numbers of *Rhingia campestris*, Mg. (Dipt., Syrphidae) in 1947 and 1948. Also notes of numbers in 1949.—B. R. Laurence, 31 Sherwood Road, Luton, Beds.

Wanted Urgently.—A few plants of Horseshoe Vetch with native soil for potting. Duplicates—numerous living forms during the season.—T. D. Fearnough, 25 Ramsey Road, Sheffield, 10.

MEETINGS OF SOCIETIES.

Royal Entomological Society of London, 41 Queen's Gate, S.W.7: May 4th, June 1st, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*. Monthly Meetings are held at Museum and Art Gallery. Particulars from Hon. Secretary, H. E. Hammond, F.R.E.S., 16 Elton Grove, Acoc's Green, Birmingham.

TO OUR READERS.

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Change of Address.—D. G. Sevastopulo, c/o Ralli Bros. Ltd., P.O. Box 401, Kampala, Uganda.

Temporary Addresses till further notice.—Kenneth J. Hayward, c/o Dept. of Entomology, British Museum (Nat. Hist.), Cromwell Road, London, S.W.7. Dr H. B. D. Kettlewell, c/o Standard Bank, Cape Town, S. Africa.

Communications received:—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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APRIL 1949

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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ABERRATIONS OF ABRAXAS GROSSULARIATA, L.

By E. A. COCKAYNE, D.M., F.R.C.P.

Raynor (*Ent. Record*, 1909, 21, 2) describes ab. *iochalca* as a form with the ground colour entirely suffused with bronze-violet, varying somewhat in intensity, and says it appeared for the first time in 1908 with ab. *chrysostrata* as a result of crossing ab. *lacticolor* with ab. *lutea*. In the following year he bred *grossulariata* with the same ground colour as ab. *iochalca*, and there is a series of thirteen of them in the National Collection. It was Raynor's custom to give different names to forms of *grossulariata* and *dohrnii* (*lacticolor*) with the same ground colour, and he had labels printed with the name *chalcostrata* for the specimens of *grossulariata* with the ground colour of *iochalca*, but never published the name.

Abraxas grossulariata, L., ab. **chalcostrata**, ab. nov.

The name applies to any form of *grossulariata*, except ab. *dohrnii*, Koenig, with the ground colour entirely suffused with bronze-violet. The violet varies in intensity in different individuals, and in those in which it is most intense there are frequently asymmetrical areas on the hindwings, which lack the orange colour of *lutea*.

Type: ♂. Lancs., ex no. 11-15, bred 29.v.1916, Raynor. Rothschild Coll.

Allotype: ♀. Peckham Rye, vii.1895, P. Richards. Rothschild Coll.

Paratypes: ♂. Lancs., ex no. 22-18, bred 17.vi.1919, Raynor. Oberthur Coll. ♂. Lancs., ex no. 73-10, bred 5.vi.1911, Raynor. Levick Coll. ♀. Lancs., ex no. 77-10, bred 16.vi.1911, Raynor. ♀. Lancs., ex G.09, bred 7.vi.1910, Raynor. Oberthur Coll.

It is difficult to believe that the violaceous or greyish lilac colour, which is mixed with orange, can be derived from pure *lutea*. Onslow (*Journ. of Genetics*, 1918, 8, 224) says that *iochalca* only occurs in the *dohrnii* forms and is probably recessive, but admits that the evidence for this is slight. At that time he was evidently not aware of the existence of *grossulariata* with the colouring of *iochalca*. The origin of *iochalca* and *chalcostrata* appears to me to be due to a combination of homozygous *lutea*, which is dominant, and a violaceous form, sometimes tinged with pale yellow, which is probably recessive. The depth of the violaceous colour varies and it is likely that it can be increased by selective breeding in the same way as the depth of the orange in *lutea*.

There are several examples of *grossulariata* and *dohrnii* of this violaceous colour in the National Collection, all of Lancashire origin, bred by Raynor. There are also 5 ab. *aberdonensis*, 2 ab. *fulvopicta*, 1 ab. *albispiciata*, 1 ab. *albipalliatata*, and 2 ab. *centralipuncta* with a mere trace of yellow or none at all. Since it appears to be of some genetic importance, I propose to name it.

Ab. **lilacina**, ab. nov.

Ground colour entirely violaceous or greyish lilac with or without a tinge of pale yellow, occurring in various forms of *grossulariata* and *dohrnii*.

Type: ♂. Lancs., ex no. 24-17, bred 24.vi.1918, Raynor. Rothschild Coll.

Paratype: ♂. Lancs., ex no. xi-07, bred x.1907, Raynor. Cockayne Coll. ♂. Lancs., ex no. L-09, bred 1.vi.1910, Raynor. Rothschild Coll.

In the two paratypes *lilacina* is combined with *fulvapicata*.

There is another rare form, which has not been named and which is probably recessive. The evidence is slight, but Onslow's specimen had normal parents, and one bred by H. B. Williams is combined with another rare recessive form.

Ab. *lilacifasciata*, ab. nov.

The fascia instead of being orange is a lilac-grey colour.

Type: ♂. 21 Da 30, bred by H. Onslow. Onslow obtained his stock from Raynor and it is probably of Lancashire origin.

Allotype: ♀. Lancs., ex no. 28-06, bred 30.vi.1907, Raynor. Rothschild Coll.

Paratype: ♂. Lancs., ex no. 48-13, bred 7.vi.1914, Raynor. R. Adkin Coll.

All these are combined with ab. *dohrnii*, Koenig.

In the Rothschild Collection there was a label in Lord Rothschild's handwriting, "ab. *infraguttata*, Raynor," but the name was never published.

Ab. *infraguttata*, ab. nov.

On the hindwing the antemedian row of spots forms a continuous black band; the spots of the postmedian row are elongated into streaks running towards the antemedian and sometimes reaching it, or the streaks may be short and followed by a line of dots; sometimes there are additional dots running towards the margin.

Type: ♀. Lancs., ex no. 0A-17, bred 7.vi.1918, Raynor. Rothschild Coll.

Paratypes: ♀. Aberdeen, bred vii.1927, L. W. Newman. Rothschild Coll. ♀. 19T ♀ 5, H. Onslow. ♀. 19T ♀ 7, H. Onslow. ♀. Yorks., ex no. 9-29, bred 2.vi.1920, Raynor. Rothschild Coll.

Onslow's specimens are probably of Lancashire origin. Most examples of *infraguttata* are female and all occur in ab. *lunulata*, Porritt, or in the *lunulata* group of forms.

Onslow (*Journal of Genetics*, 1918, 8, 222) names a form of *grossulariata* with black rings round the abdomen ab. *nigrocincta*, and says that appears to be associated with increased black markings on the forewings, but does not occur in ab. *varleyata*. No doubt at a later date he would have withdrawn this statement, because he bred *nigrocincta* combined with ab. *dohrnii*. It is commonest in combination with ab. *hazeleighensis* or forms belonging to this group, but also occurs in abs. *nigrofasciata*, *infrabifasciata*, *infraguttata*, *aberdonensis*, *varleyata*, and *dohrnii*.

Looking at Onslow's material, which consists of parts of broods with their parents, it seems fairly certain that *nigrocincta* is an autosomal recessive inherited independently of any other character.

ACTIVITY AND MORTALITY OF *PIERIS RAPAE* IN AMERICA, AFRICA, AND EUROPE.

By ORAZIO QUERCI and LYCAENA ROMEL, M.D.

Pieris rapae has the privilege of being the single butterfly, growing rapidly and without summer pauses, which is widespread in many countries of the world. In a paper, printed in this magazine¹, we related what noted, day by day about this species, both in a meadow of Philadelphia and in our breedings.

Fourteen years ago, considering chiefly the effects of temperature and humidity, we were often unable to know the causes that either favour or injure the development of that insect. This deficiency induced us to continue its study in other regions. Only now, after many trials, we think we have reached a satisfactory result about *rapae* in Pennsylvania, while we can not explain why the identical kind of larvae have a different behaviour in some European and African localities in which we have reared them.

As it is known, the females of *rapae* lay many eggs², and this species would multiply its number indefinitely. Our purpose has been that to identify the forces that eliminate continually a percentage of progeny and re-establish the biological equilibrium.

In the case of *rapae* it is easy to know on which day many larvae die in the field. The mortality of its pupae is small³ and they are not subjected to summer diapause. Both in the spring and summer, if the temperature does not drop, some pupae produce adults even in 6 to 8 days since they were formed. Therefore, when we note that the number of adults on the wing either does not increase, or decrease, we infer that a great mortality of caterpillars occurred about a week before. However, it has been hard for us to identify all the different factors of destruction and to know in which manner each factor acts in concomitance with the others.

Now we consider: (A) Degree of humidity of the ground in our collecting place. (B) Amount of weeds in the same land. (C) Time of the day in which it begins and ends to rain. (D) Amount of rain. (E) Occurrence of thunderstorms. (F) Intensity of the solar rays. (G) Intensity of the radiation reflected from the ground. (H) Temperature. (I) Hours of sunshine. Other factors (degree of humidity of the air, dew, velocity and direction of the wind) are mentioned when they have some influence.

TABLE I.

Factors of the climate and environment acting most upon the development of *Pieris rapae* at Philadelphia in 1932.

Signs: + + + + + = Highest intensity of humidity of the ground; amount of weeds in the field. + = Low intensity. O = Very feeble intensity. T = Trace of rain.

¹Entom. Rec., XLVIII, pp. 14-133 (1935).

²Wellhouse, W. H., *How Insects Live*, p. 156: "A female has been observed, to deposit her 238 eggs: 125 were laid on the first day after mating, 75 on the second day, 37 on the third and fourth day, and 1 on the fifth day."

³Only those pupae, formed by the feeblest larvae, collapse almost independently from climate. Parasites seem to be missing in the meadow where we collected: ants were sometimes plentiful.

| | Date | Soil | Weeds | Occurrence of rain | | |
|----|-------|-------|-------|--------------------|-----------|------|
| | | | | begins | ends | inch |
| | May | | | | | |
| | 11-14 | +++++ | +++++ | 4.12 p.m. | night | 1.37 |
| 1 | 15-20 | +++++ | +++++ | early | early | 0.03 |
| 2 | 21-25 | + | +++ | 9.35 p.m. | night | 0.23 |
| 3 | 26 | O | ++ | | | |
| 4 | 27 | O | + | 4.43 p.m. | 7.08 p.m. | 1.00 |
| 5 | 28-31 | +++++ | + | | | |
| | June | | | | | |
| 6 | 1-3 | + | + | | | |
| 6 | 4 | O | + | 2.02 p.m. | 2.09 p.m. | T |
| 7 | 5 | O | + | 4 15 p.m. | 4.50 p.m. | T |
| 8 | 6 | O | + | 8.46 p.m. | 9.50 p.m. | 0.05 |
| 9 | 7-8 | ++ | + | | | |
| 9 | 9-11 | O | + | | | |
| 10 | 12-14 | +++++ | + | early | 6.50 p.m. | 0 |
| 11 | 15-17 | +++++ | O | 4.09 p.m. | 9.45 p.m. | 2.21 |
| 12 | 18-21 | +++ | O | early | 6.30 p.m. | 0.05 |
| 13 | 22 | O | O | | | |
| 14 | 23-25 | O | O | | | |
| 15 | 26 | O | + | noon | 3.40 p.m. | 0.07 |
| 16 | 27-29 | +++++ | ++ | noon | night | 0.26 |
| 17 | 30 | ++++ | +++++ | | | |
| | July | | | | | |
| 18 | 1 | ++ | +++++ | | | |
| 19 | 2-3 | O | +++++ | | | |
| 20 | 4-6 | +++++ | +++++ | early | noon | 0.30 |
| 21 | 7-8 | ++++ | +++++ | | | |
| 22 | 9-10 | +++ | +++++ | | | |
| 22 | 11 | + | +++++ | early | early | T |
| 22 | 12 | O | +++ | night | night | T |
| 22 | 13-19 | O | ++ | | | |
| 23 | 20 | O | O | early | early | 0.04 |
| 24 | 21-23 | +++++ | O | early | night | 1 67 |
| 25 | 24-26 | +++ | O | | | |
| 26 | 27 | ++ | O | 5.03 p.m. | 5.55 p.m. | 0 19 |
| 26 | 28 | +++ | + | | | |
| 26 | 29-31 | O | +++ | early | early | 0.05 |
| | Aug. | | | | | |
| 27 | 1-2 | O | +++ | 3.50 p.m. | night | 0.03 |
| 28 | 3 | +++++ | +++++ | night | 8.55 p.m. | 0 48 |
| 29 | 4-5 | +++++ | +++++ | | | |
| 29 | 6-7 | ++++ | +++++ | 3.10 p.m. | 6.50 p.m. | 0 03 |
| 29 | 8-9 | +++ | +++++ | early | early | T |
| 30 | 10 | + | +++++ | 6.15 p.m. | night | 1.28 |
| 31 | 11-16 | +++++ | +++++ | night | early | 0.07 |
| 32 | 17-19 | +++++ | +++++ | 5 52 p.m. | night | 0.75 |
| 33 | 20-21 | ++++ | +++++ | | | |
| 33 | 22-25 | + | +++++ | | | |
| 33 | 26 | O | +++ | | | |
| 34 | 27 | O | ++ | 6 22 p.m. | 7.09 p.m. | 0.41 |
| 35 | 28 | ++++ | ++ | | | |
| 35 | 29-30 | + | + | | | |
| 36 | 31 | O | + | 6.24 p.m. | 6.50 p.m. | 0.02 |
| | Sept. | | | | | |
| 37 | 1 | O | + | | | |
| 37 | 2 | O | + | | | |
| 37 | 3 | O | O | | | |
| 37 | 4 | O | O | 5.15 p.m. | 5.25 p.m. | T |
| 37 | 5 | O | + | night | night | 0.08 |
| 38 | 6 | +++++ | ++ | night | early | 0.11 |

| | Date Sept. | Soil | Weeds | Occurrence of rain | | |
|----|---------------|-------|-------|--------------------|-----------|------|
| | | | | begins | ends | inch |
| 38 | 7-8 | +++++ | +++ | | | |
| 38 | 9-10 | +++ | +++++ | | | |
| 39 | 11-15 | ++ | +++++ | | | |
| 40 | 16 | +++++ | +++ | early | noon | 0.36 |
| 41 | 17-19 | +++++ | ++ | | | |
| 42 | 20-21 | +++ | ++ | | | |
| 43 | 22 | + | + | | | |
| 43 | 23 | O | + | 3.27 p.m. | 4.15 p.m. | 0.05 |
| 44 | 24-26 | O | + | | | |
| 45 | 27-28 | +++++ | + | early | 1.12 p.m. | 0.45 |
| 46 | 29-30 | +++++ | + | | | |
| | Oct. | | | | | |
| 47 | 1-3 | +++++ | + | | | |
| 48 | 4-6 | +++++ | + | night | night | 1.29 |
| 49 | 7-8 | +++++ | + | | | |
| 50 | 9-14 | +++ | | 1.35 p.m. | 4.50 p.m. | 0.01 |

With the support of these data, and some experiments (*Entom. Rec.*, XLIX, pp. 73-76 (1937)), we try, in the following Table II, to show in which manner the combinations of factors of climate and environment might act upon the life-cycle of *Pieris rapae* at Philadelphia.

(To be continued.)

RECENT ENTOMOLOGICAL NOTES FROM SOUTH LONDON.

By S. WAKELY.

Collecting in London parks and suburban roads might not sound very promising, but it is surprising the numbers of good insects that can be taken during the season on occasional walks in parks and by keeping an eye on fences and trees by the roadside.

The insects mentioned in these notes are those that have been of particular interest to me, and are not by any manner of means a complete list even of the insects taken by myself locally.

Mimas tiliae, Linn., is a well-known London hawk-moth, and is frequently seen at rest on fences, but the larvae are quite conspicuous after dark in August and September feeding on the lower branches of lime trees. With the aid of an electric torch and walking stick with suitable crook to bring the branches down within reach, a few dozen larvae can be easily collected, particularly where the trees are pollarded yearly, thus giving plenty of low branches.

Sphinx ligustri, Linn., larvae are not infrequent on the privet, where their presence is betrayed by the frass on the pavement. I have not met with *Deilephila elphenor*, Linn., at Herne Hill, but saw two specimens caught at light in Fleet Street last summer.

I suppose my greatest surprise was the sight of a freshly-emerged specimen of *Pseudoips bicolorana*, Fuessl., at rest on an oak tree just inside Brockwell Park by Herne Hill Station last summer.

Erannis aurantaria, Esp., was frequently seen on the fences at Dulwich in late autumn—hardly an insect one would expect to find breeding freely in London gardens.

Larvae of *Gonodontis bidentata*, Clerck, were found to be common on the Winter-flowering Jessamine (*Jasminum nudiflorum*), together with a few *Ourapteryx sambucaria*, Linn. Both ivy and elder are the usual foodplants for the Swallow-tail Moth, and the addition of Jessamine is interesting. *G. bidentata* larvae have a great liking for privet in London gardens.

Aegeria vespiformis, Linn., larvae frequent the bark of old elms in Brockwell Park, Hyde Park, etc., also the large "cankorous" growths often seen on large oaks. Their frass is much in evidence, but one does not find the larvae as easily as one would expect from the signs of feeding, and digging lumps of bark off trees in London parks is not to be recommended!

Cacoecia pronubana, Hübn., is a most common moth, the larvae feeding not only on privet, but on almost every garden plant—from rose-buds to the Petty Spurge (*Euphorbia peplus*) which grows as a weed in our gardens.

In June and July the freshly-emerged imagines of *Pammene juliana*, Curt. (on oak), and *P. regiana*, Zell. (on sycamore), may be taken from 10 a.m. to 12 noon. Later in the day they gradually crawl higher up the trunks and disappear. The former is not at all uncommon in Brockwell Park and at Tooting Common. *Laspeyresia splendana*, Hübn., larvae may be found in acorns lying in the gutters of the roads near the Crystal Palace in October.

The berries of pyracantha are much liked by the larvae of *Laspeyresia ianthinana*, Dup., and *Blastodacna hellerella*, Dup., together with the larvae of the trypetid fly *Anomoia permunda*, Harris. These three insects are normally hawthorn feeders.

That local insect *Blastodacna stephensi*, Staint., swarms on old oaks in Dulwich Park during July and August. They look very like *Recurvaria nanella*, Hübn., an occasional specimen of which is found with them. Collecting *B. stephensi* can be made amusing (or embarrassing) by the crowds of people at the boating lake, particularly when the moth has to be tickled out of a crevice with a blade of grass and guided into the box. This species was recorded from Tooting Common many years ago, and it still occurs there in numbers. Strangely enough, I can find no trace of it in Brockwell Park, although there are plenty of old oaks there. The older the tree, the more likely one is to find the moth present, the larvae almost certainly feeding in the bark.

Larvae of *Lithocolletis geniculella*, Rag., on sycamore are to be found at Dulwich, while the local *L. comparella*, Zell., occurs on white poplar near Streatham, the only locality for this species I know.

Bedellia somnulentella, Zell., occurs at Dulwich, and the larvae on wild convolvulus are frequent at Brockwell Park and even near Loughborough Junction, where the foodplant grows over garden fences.

The species of *Blastobasis* at present referred to as *decolorella*, Woll., occurs with its usual regularity in June and October on the fences in this district, but there is no evidence of it spreading further afield. It is not likely to be confused with its congener, *B. lignea*, Wals., which is rare here and is a single-brooded species occurring in July-August. A fuller description of this insect is to be found in the *Proceedings of the South London Natural History Society* for 1947/48.

38 Stradella Road, Herne Hill, S.E.24.

SOME OBSERVATIONS ON *EMPIS LIVIDA*, LIN. (DIP., EMPIDIDAE), WITH NOTES ON PREY.

By KENNETH G. V. SMITH, F.R.E.S.

The male of *Empis livida*, Lin., takes prey which is presented to the female and while she feeds upon it copulation takes place, the duration of which probably depends upon the size of the prey (see Hamm, 1908, 9). I was able to study this species while on a week's holiday at Bodenham, near Hereford, during 1948. Although I was not fortunate in having fine weather for my activities, I did make some interesting observations as well as securing some specimens with prey.

The best spot for observation was along the River Lugg, where *livida* was in fair numbers among the rushes which grew along the water's edge. Heavy rainfall had churned the banks into mud and this hampered my activities considerably. Observations were commenced on 31st July between 3.30 p.m. and 6 p.m. (B.S.T.), the weather being very dull indeed. Both sexes were at rest on the rushes and forget-me-nots. Several females were sitting close together and periodically one or the other would take to flight. This prompted the others to follow suit, and all would circle round several times before coming to rest again, most often in a different place to that previously occupied. I saw no pairs *in cop.* but I captured a few males with dipterous and trichopterous prey.

On the evening of 1st August, at about 7 p.m., I saw a few pairs *in cop.* along a hedgerow. Unfortunately, I was without a net but I managed to box a pair; the female was in possession of dipterous prey. Previous to capture I had watched this pair making short flights from one twig to another, hardly resting before they were off again. The landing seemed clumsy and made considerable noise, and judging by the short distances covered by each flight quite an effort seemed necessary to keep in the air. I did not observe if both insects made use of their wings, but it would be interesting to note this on some future occasion. The wariness of these insects in my experience makes close observation difficult.

2nd August was another dull day with frequent rainy periods and *livida* was not very active. I only saw one pair *in cop.*, which I secured. The female dropped the prey and the pair separated. On taking this from the net I found it to be the mutilated remains of a *Chironomid* fly. One single male was taken with trichopterous prey.

The poor weather persisted throughout Tuesday, 3rd August, and the vegetation was wet, due to a heavy rainfall during the night. I only saw two single males with prey, one of which I secured; this had dipterous prey. The other I followed for some time, hoping to observe courtship and copulation. It made frequent circling flights, apparently in search of females, but eventually I lost it among the rushes. The prey appeared to be dipterous, but I was not close enough to be certain. Several individuals were at rest on flowers of forget-me-not, each actively moving its proboscis over the surface of the petals. On closer examination it could be seen that they were drinking from the globules of rain scattered over the surface of the flowers.

4th August was a much brighter and warmer day, but the sun did not break through the clouds until the afternoon. There was considerable activity among *livida* and I was soon busy collecting material. The prey taken was quite varied among various families of Diptera and I was quite satisfied with the morning's work.

Rain came again during the night, and it continued throughout most of the morning of 5th August. The sun broke through once, and what activity this promoted I took advantage of. I took two males with ephemeropterous prey. I had wondered why I had not encountered this before, as there were a number of mayflies about. I saw three pairs *in cop.*, two out of reach and one which I followed for some time but eventually lost. Further upstream along a sheltered backwater, which was drier and more pleasant to work, I found *livida* in some numbers, at rest on thistles and nettles. Both sexes were engaged in imbibing nectar from the thistle flowers.

6th August commenced warm and bright and I was filled with the hope of a good day's work, but by 10.30 a.m. the skies had clouded and rain commenced. Although I spent the rest of the morning observing from beneath a nearby tree I saw little of interest and collected very little material.

METHODS OF HOLDING PREY.

The majority of the single males employed the median pair of legs only in holding the prey, the anterior and posterior pairs being used to hold on to their place of rest. A few of them were holding their prey with the posterior and median pairs of legs and one of the anterior pair, the remaining anterior leg bearing the whole weight of the insect as it hung suspended from the twig or leaf on which it had settled. The prey taken from the single males was apparently uninjured, though motionless with the exception of a badly mutilated ephemeropteran (*Ephemerella ignita*, Pod.) devoid of its abdomen, and the *Chironomus* and *Culex* marked with a ? in the table. Possibly the male had already contacted a female which had fed on the prey, but it seems hardly likely that he would take back the prey after an attempt at copulation. The specimen of *Mystacides nigra*, L., was still feebly kicking when I took it from the net, but this must have taken a little more to kill as it was quite large compared with the other types of prey met with.

Of the pairs observed *in cop.* the male was hanging by either of the two anterior tarsi, or by both of them. All the remaining legs were used to clasp the female. The female employed all her legs in holding the prey and thrusting it up and down on her proboscis.

SUMMARY AND ANALYSIS OF PREY.

I saw no single females in possession of prey, only those *in cop.* Of all the males with prey not one appeared to be feeding on it. Mr A. H. Hamm gives an interesting account of the method of disabling the prey adopted by *Empis tessellata*, Fab. (*Ent. Mon. Mag.*, 1909, Vol. XX, p. 159), i.e., by piercing the junction between the thorax and the head, apparently affecting the central nervous system and producing a paralyzing effect. It may be that *livida* adopts this method also.

Copulation apparently takes place at all hours of the day and in fine or wet weather.

The following table illustrates the nature of the prey taken from 35 sets of material collected. From these results it can be seen that most of the prey taken belong to the Diptera. I can find no previous record of Hemiptera being taken as prey by *livida*. The author would welcome any notes or records of the predaceous habits of the Empididae.

| Order. | Family. | Species. | No. taken | | |
|---------------|-----------------|--|----------------|------------------------|--------|
| | | | From single ♂♂ | From ♂♂ and ♀♀ in cop. | Total. |
| Ephemeroptera | Leptophlebiidae | <i>Paraleptophlebia cincta</i> , Retz. | 3 | — | 3 |
| | | <i>Habrophlebia fusca</i> , Curt. | 1 | — | 1 |
| Trichoptera | Ephemerellidae | <i>Ephemerella ignita</i> , Poda | 1 | — | 1 |
| | Leptoceridae | <i>Mystacides nigra</i> , Lin. | 1 | — | 1 |
| | Polycentropidae | <i>Cyrnus trimaculatus</i> , Curt. | 1 | — | 1 |
| Hemiptera | Psychomyidae | <i>Psychomyia pusilla</i> , Fab. | 8 | — | 8 |
| | Miridae | <i>Orthotylus flavinervis</i> , Kbm. | 1 | — | 1 |
| Diptera | Culicidae | ? <i>Culex pipiens</i> , Lin. | 1 | — | 1 |
| | Chironomidae | <i>Pentaneura monilis</i> , Lin. | 1 | — | 1 |
| | | ? <i>Chironomus</i> spp. | 1 | — | 1 |
| | | ?Mutilated | — | 1 | 1 |
| | Mycetophilidae | <i>Mycetophila fungorum</i> , Deg. | 1 | — | 1 |
| | Empididae | <i>Rhamphomyia flava</i> , Fall. | — | 1 | 1 |
| | Dolichopodidae | <i>Campsicnemus scambus</i> , Fall. | 1 | — | 1 |
| | Sepsidae | <i>Sepsis cynipsea</i> , Lin. | — | 1 | 1 |
| | Sphaeroceridae | <i>Trichiaspis stercoraria</i> , Mg. | 1 | — | 1 |
| | Cordyuridae | <i>Scopeuma stercoraria</i> , Lin. | — | 1 | 1 |
| | Calliphoridae | <i>Morinia nana</i> , Mg. | 1 | — | 1 |
| | | <i>Pollenia varia</i> , Mg. | 1 | — | 1 |
| | Muscidae | <i>Limnophora triangula</i> , Fall. | — | 1 | 1 |
| | | <i>Limnophora scrupulosa</i> , Zett. | 1 | — | 1 |
| | | <i>Hebecnema umbratica</i> , Mg. | 1 | — | 1 |
| | | <i>Helina duplicata</i> , Mg. | 1 | — | 1 |
| | | <i>Myopina reflexa</i> , R.-D. | 1 | — | 1 |
| | | <i>Pogohylemyia gnava</i> , Mg. | 1 | — | 1 |
| | | <i>Erioischia brassicae</i> , Bouché | — | 1 | 1 |
| | | | 29 | 6 | 35 |

ACKNOWLEDGMENT.

I am indebted to the following gentlemen for the determination of the prey, which in some cases, due to mutilation, must have provided no mean task.

Hemiptera—Mr S. E. W. Carlier, F.R.E.S.

Trichoptera and Ephemeroptera—Mr D. E. Kimmins, Department of Entomology, British Museum (Nat. Hist.).
Diptera—Professor L. W. Grensted.

My thanks are also due to Mr A. H. Hamm for his kindness in sending me separates of his papers and to the Royal Entomological Society of London for the loan of Professor E. B. Poulton's paper (1906). All the material has been presented to the Hope Department of Entomology, University Museum, Oxford.

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"Antiopa," 38 Barrow Street, Much Wenlock, Salop.

CURRENT NOTES.

WINTER FLIES.—Few fly fishers give much thought to their streams during the winter months; yet the winter fly hatches are worth more thought than is usually given to them. It has been a queer winter on the quieter streams; perhaps a still queerer autumn. October and November last year produced hatches which were almost as good as those during the fishing season. One Wiltshire stream even had a distinctly good hatch of mayfly, of all odd happenings, in November, and from the number of mayfly nymphs killed in a Berkshire pollution near the end of October it is probable that this phenomenon took place on many streams where lack of grayling fishers prevented it being reported.

Were these autumn hatches from a spring egg laying, a good part of which had matured before the winter instead of the more usual course of growing very slowly in the cold months and hatching in the spring? And will this mean a poorer hatch of what is left for the spring months?—M. B.

THE Zoological Section of the S.E. Union of Scientific Societies, held at Canterbury, April 19th-22nd. Programme from Winifred Boyd Watt, Hon. Secretary.

THE magazine is suffering from the lack of the smaller "Collecting Notes." The abnormal weather must have affected many early stages of our Spring Lepidoptera. In such circumstances immigrant species will not survive unless they have already become firmly established.

For many years most of the countries of Western and Central Europe had sufficient entomologists to support two magazines. With these we have been in exchange. It was different with the French. Rev. Burrows and I became Life Members of the Ent. Soc. de France, which gave us the *Ann.* and *Bulletin*. I then subscribed to the very excellent little *L'Amateur de Papillons* of M. Leon L'homme. For many years L'homme has been working at a fully annotated *Catalogue of the Lepidoptera of France and Belgium*.

The whole of the section of the Macro-Lepidoptera is complete and parts I and II of the Micro-Lepidoptera have appeared up to 1938-9. All that could be issued was a MSS. List of the names of the contents to be considered in the future of this. I have a copy "List of Species" to be dealt with in the succeeding parts of the work, III, IV, V, VI. I and II are already issued.

In early 1938 the magazine took the title *Revue Francaise de Lepidopterologie*. In 1939, after about a year's issue, it ceased. We hear that an attempt to carry on is about to be made. We hope it will be successful.

BELGIUM has the *Bull. and Ann. of the Soc. Ent. de Belge*, issued from Brussels, where the meetings are held; the other is the excellent small periodical *Lambillionæa*. The two from Holland are less known, as so few British know the Dutch language. The *Tijdschrift*, which contains the chief writings of Lempke, and the *Entomologische Berichten*. Sweden has the same difficulty, the language—the *Tidskrift* and *Opuscula Entomologica*. And Finland, *Suomi*.

WE have great difficulty in getting Current Notes, and also this year short Collecting Notes have failed to reach us. Several Obituaries were awaiting for record, and one written and posted has failed to arrive.

THE mention of Drury, the famous author and collector of the eighteenth century, has brought us an article both informative and interesting. The opportunity will induce us to have the two precious items of Drury we possess as folding plates to illustrate the memoir. Presumably these are in Drury's own handwriting and consist of a List of the Contents of the Collection and the document of the circumstances which compel him to part with it. This article will probably appear in the May number and the plates later.—HY. J. T.

COLLECTING NOTES.

COLIAS HYALE AT SWANAGE.—Friday, 1st April, was a warm day, temperature 55 to 60. At 12.30, as I was strolling over the Peveril Downs, I saw *C. hyale* flying over the rough herbage. It flew round in short circles, and then settled a couple of yards away, and I was able to identify it as a female. It was in a perfectly fresh condition, so probably owing to the very mild winter here got through in the larval stage, completed its life cycle, and had just recently emerged.—LEONARD TATCHELL.

EARLY EMERGENCES IN 1949.—The following have been noted at Uley, Glos. (400 ft.):—19.iii, *Cidaria badiata*; 21.iii, *Pieris rapae*, and continuously since then; 22.iii, *Diurnea fagella*; 26.iii, *Bombylius major*, *Atsophila aescularia*; 1.iv, *Spilosoma lubricipeda* (*Mentrastri*), in gardener's shed, doubtless "forced"; 14.iv, *Opisthograptis luteolata*, *Euchloë cardamines* ♂ (♀ on 15.iv); 15.iv, *Pararge aegeria*.—T. BAINBRIGGE FLETCHER, 15.iv.49.

DISPHRAGIS COERULEOCEPHALA ON LAUREL.—On 27.v.48 at Uley, Glos., I found several larvae of *Disphragis coeruleocephala* feeding on Laurel leaves, which they had evidently been eating for some time. None were to be found on an adjacent Hawthorn hedge but possibly, if any had been present on the Hawthorn, they had fed up earlier as larvae feeding on a merely tolerated foodplant often develop very slowly, for example, larvae of *Pieris brassicae* on *Arabis* as compared with larvae on *Brassica*.—T. BAINBRIGGE FLETCHER, 15.iv.49.

TINEA ARCELLA is a "rather common" species according to the text-books, but is one that has hitherto eluded me. It was, however, common at Uley, Glos., in July and August 1948 along hedges in the late evening, most frequently disturbed from amongst *Corylus* leaves.—T. BAINBRIGGE FLETCHER, 4.iv.49.

MIGRANTS in 1948 were not common, as already noted by many others. At Uley, Glos., *Vanessa atalanta* was represented by 31 individuals. Seen from 23.vi to 19.x, *V. cardui*, by only one, on 29.viii, a date on which I saw the "five possibles," i.e., all the species of *Vanessa* found locally, *cardui*, *atalanta*, *io*, *urticae* and *c-album*. *Sesia stellatarum*, one, not very fresh, on 22.viii. *Euchalcia gamma*, a few, from 24.vi to 23.x, of which three were wings of individuals devoured by bats; on 12.x one *gamma* was seen flying South at 1400 hours during a sunny interval after a heavy shower at 1200, there being a light South-Westerly breeze at the time. One of the *V. atalanta* came to light on the night of 5.ix.—T. BAINBRIGGE FLETCHER, 4.iv.49.

RHINGIA CAMPESTRIS.—With reference to the notes by Messrs Laurence, Andrews, Verdcourt and Parmenter (*Ent. Rec.*, LX, 100, 107, 108, 119) on the scarcity of *Rhingia campestris* in the Spring of 1948, I would note that at Uley, Glos., this species was abundant in May 1948 and occurred commonly throughout the Summer to mid-September and more sparingly into October.—T. BAINBRIGGE FLETCHER, 4.iv.49.

OSMYLUS FULVICEPHALUS.—An example of *Osmylus fulvicephalus* was found on 3.vii.48 near Uley, Glos., being beaten from vegetation overgrowing a small roadside streamlet. This seems a late date.—T. BAINBRIGGE FLETCHER, 4.iv.49.

BRITISH DIPTEROLOGICAL LITERATURE. SUPPLEMENT IV.

By H. W. ANDREWS, F.R.E.S.

For previous Lists see *Ent. Record*, Vol. 43 (March 1931), Vol. 47 (December 1935), and Vol. 55 (May 1943).

General Works.—Kloet, C. S., and Hincks, W. D.: "A Check List of British Insects." [Published at Stockport in 1945 by Kloet and Hincks, now at 110 Sackville Street, Manchester 1; price £2 12/6.] Lists of species of all Orders. The section dealing with Diptera gives 5199 species, and is the only complete list since the 2nd Edition of Verrall's *List of British Diptera* was published in 1901.

Nomenclature.—Smart, John: "An annotated Bibliography-Chronology of the Literature and Events relating to the Generic Names of Meigen, 1800." [Published in *The Annals and Magazine of Natural History*, Ser. II, Vol. XI, pp. 261-272, April 1944.] This pamphlet, explained by its title, should prove most useful as a reference work to all—especially writers—interested in this thorny subject.

ORTHORRHAPA.

(NEMATOCERA.)

Simuliidae.—Smart, John: "The British Simuliidae, with Keys to the species in the Adult, Pupal, and Larval Stages." [Published as Scientific Publication No. 9 of The Freshwater Biological Association of the British Empire, Wray Castle, Ambleside, Westmorland, 1944; price 2/6.] A very comprehensive revision of the British Species of the family, dealing not only with the Adults, but also with the earlier stages. In addition to the Analytical Keys there is an introductory chapter on Structure, Life History, Bloodsucking Habits, etc.; also notes on Ecology and Distribution and a Bibliography. There are 17 text figures.

ORTHORRHAPA.

(BRACHYCERA.)

Asilidae.—Hobby, B. M.: "Epitriptus cowini, a new Asilid (Dipt.) from the Isle of Man." [Published in *E.M.M.*, Vol. LXXXII, Pt. 4, April 1946.] Detailed description with plate and figures of terminalia, account of locality and captures. Also revision of that portion of the analytical table in Dr Hobby's "Key to the British species of Asilidae" (vide my Annotated List, Suppt. II, p. 2) covering the genera *Machimus* and *Epitriptus*.

- do. —— Parmenter, L.: "*Laphria gilva* (L.) (Dipt. Asilidae) in Surrey, with a Key to the British Laphriinae." [Published in *E.M.M.*, Vol. LXXXII, Pt. 12, December 1946]. Notes on captures of this species and analytical table of the three British species of the genus.
- Therevidae.**—Collin, J. E.: "British Therevidae (Diptera)" [Published in *Proceedings of The Royal Physical Society*, Vol. XXIII, Pt. II, 1948.] A revision of the three British Genera and species. Analytical Tables and notes on species.
- Dolichopodidae.**—Collin, J. E.: "A revised Table of the British species of *Argyra*, Meq. (Dipt., Dolichopodidae)." [Published in *E.M.M.*, Vol. LXXIX, Pt. 5, May 1943.] Analytical Tables of ♂♂ and ♀♀ with notes on individual species.
- do. —— Parmenter, Capt. L.: "*Submeditera cuneata*, Becker. (Dipt., Dolichopodidae) new to Britain." [Published in *E.M.M.*, Vol. LXXVI, No. 7, July 1940.] Description and notes.
- do. —— d'Assis-Fonseca, E. C. M.: "*Syntormon macula*, Par. (Dipt., Dolichopodidae), an addition to the British List." [Published in *Ent. Record*, Vol. 60, June 1948.] Notes on this species (♀♀ only).
- do. —— Collin, J. E.: "Confirmation of *Dolichopus plumitarsis*, Flin., as a British species and an additional record of *D. agilis*, Mg. (Dipt., Dolichopodidae)." [Published in *E.M.M.*, Vol. LXXX, No. 1, January 1944.] Descriptive notes on these two species.

CYCLORRHAPHA.

(PROBOSCIDEA.)

- Syrphidae.**—Wainwright, C. J.: "A new British Syrphid (Diptera) *Lasiophthicus (Catobomba) albomaculata*, Macq. (*gemelarii* Rond.). [Published in *E.M.M.*, Vol. LXXVIII, January 1942.] Comparative description of this and the other two British species of the genus.
- do. —— Goffe, Capt. E. R.: "*Volucella zonaria*, Poda. (Dipt., Syrphidae) in Britain." [Published in *E.M.M.*, Vol. LXXXI, No. 7, July 1945.] Notes of recorded captures of *V. zonaria* up to 1943, and Key to the British species of *Volucella*, including *zonaria*.
- Tachinidae.**—d'Assis-Fonseca, E.C.M.: "Dionaea aurifrons Meig. (Dipt., Larvaevoridae), a genus and species new to Britain." [Published in *E.M.M.*, Vol. LXXXIII, No. 5, May 1947.] Short description of above species. A fuller description by Mr Fonseca appeared in No. 12, December 1947, of the same volume.
- do. —— Day, Dr C. D.: "British Tachinid Flies" Tachinidae (Larvaevoridae and Calliphoridae)." [Reprinted in book form from *The North Western Naturalist*, and published by T. Buncle Co. Ltd., Market Place, Arbroath, December 1948; price 15/6, post free.] A Key for the identifica-

tion of the Genera and Species, with short descriptions and notes on habitats, localities, etc. A very useful work on this group. Looks more formidable than it is owing to the extensive use of abbreviations by the author, which, however, are all explained in preliminary prefaces. Eleven plates and over 200 figures. The plates of wings (with a separate key supplementary to the general one) and those of genitalia, should prove a great help to identification.

Muscidae.—Collin, J. E.: "The Classification of the Genera allied to *Musca*, L." [Published in *Proc. R. ent. Soc. Lond.*, Series B, Vol. 17, Pts. 9-10, October 1948.] Explained by its title.

Anthomyiidae.—Niblett, M.: "Diptera bred from flower heads of compositae." [Published in *Ent. Record*, Vol. 58, No. 10, October 1946.] Explained by its title, mostly species of Anthomyiidae.

ACALYPTERATE MUSCIDAE.

Chamaemyiidae (Ochtiphilidae).—Coe, R. L.: "The British species of the Genus *Chamaemyia* (Dipt. Chamaemyiidae)." [Published in *E.M.M.*, Vol. LXXVIII, Pt. 8, August 1942.] Analytical Tables, Notes on species and their considerable variation, 5 Text figures of genitalia, and Bibliography.

——— do. ——— Coe, R. L.: "*Chamaemyia juncorum*, Fall., and *C. herbarum*, R.-D. (Dipt. Chamaemyiidae): a correction to my recent Paper on the British Species of the Genus (with fig.)." [Published in *E.M.M.*, Vol. LXXIX, Pt. 6, June 1943]. Explained by its title.

Helomyzidae.—Collin, J. E.: "The British Species of Helomyzidae (Diptera)." [Published in *E.M.M.*, Vol. LXXIX, Nos. 10 and 11, October and November 1943.] Analytical tables, descriptions of new species, and notes on species.

Psilidae.—Collin, J. E.: "The British Species of Psilidae (Diptera)." [Published in *E.M.M.*, Vol. LXXX, Nos. 9 and 10, September and October 1944.] Analytical tables, descriptions of new species, and notes on species.

Micropezidae.—Collin, J. E.: "British Micropezidae (Diptera)." [Published in *Ent. Record*, Vol. 57, Pt. 10, October 1945.] Analytical Tables of Sub-families, Genera and Species. Notes on distribution.

Trypetidae.—Collin, J. E.: "The British Genera of Trypetidae with notes on a few species." [Published as a Supplement in *Ent. Record*, Vol. 59, Nos. 1 and 2, January and February 1947.] A long wanted and up-to-date key to this attractive group. Analytical Tables of sub-families and genera, with lists of species pertaining to each genus. No analytical tables of species. (Reprints of this valuable paper can be obtained from Hon. Treasurer, *Ent.*

Record, The Rookery, Breamore, Fordingbridge, Hants.; price 2/6.)

—— do. —— Collin, J. E.: "*Tephritis separata*, Rdi., an additional British species allied to *T. conjuncta*, Lw. (Diptera, Trypetidae). [Published in *Ent. Record*, Vol. 55, No. 9, September 1943.] Detailed comparison of these two species with critical notes on their nomenclature.

—— do. —— Niblett, M.: "British Trypetidae, additional notes." [Published in *Ent. Record*, Vol. 58, No. 1, January 1946.] The fifth of Mr Niblett's useful papers dealing with breeding and collecting Trypetids.

—— do. —— Collin, J. E.: "*Spilographa virgata*, sp. n. (Diptera, Trypetidae)." [Published in *Ent. Record*, Vol. 58, No. 2, February 1946.] Full description of a fifth species of this genus.

Sapromyzidae.—Collin, J. E.: "A short synopsis of the British Sapromyzidae (Diptera)." [Published in *Trans. R. ent. Soc. Lond.*, Vol. 99, Pt. 5, 25th June 1948.] Analytical Tables of Genera and Species with critical notes; also notes on certain species. Three text figures.

Opomyzidae.—Collin, J. E.: "The British species of Opomyzidae (Diptera)." [Published in *Ent. Record*, Vol. 57, No. 2, February 1945.] Analytical Tables and notes on species.

Anthomyzidae.—Collin, J. E.: "The British species of Anthomyzidae (Diptera)." [Published in *E.M.M.*, Vol. LXXX, No. 12, December 1944.] Analytical Tables of Genera and Species, with notes on species. Two text figures.

Ephydriidae.—Collin, J. E.: "The British species of *Psilopa* Flm and *Discocerina*, Mcq. (Dipt., Ephydriidae)." [Published in *E.M.M.*, Vol. LXXIX, No. 7, July 1943.] Analytical Tables of Genera and Species, notes on individual species.

Chloropidae.—Collin, J. E.: "The British Genera and Species of Oscinellinae (Diptera, Chloropidae)." [Published in *Trans. R. ent. Soc. Lond.*, Vol. 97, Pt. 5, 20th August 1946.] Analytical Tables of Genera and Species, with notes on individual species. Six text figures.

Note.—In addition to Mr Collin's paper on "The British Genera of Trypetidae," reprints of some of his other papers published in *The Entomologist's Record* are still available for purchase. Applications should be made to The Hon. Treasurer, *The Entomologist's Record*, "The Rookery," Breamore, Fordingbridge, Hants.

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A FORTNIGHT'S COLLECTING IN SWITZERLAND (JUNE/JULY 1948).

By S. N. A. JACOBS.

JUN 10 1949

With the improvement in facilities for foreign travel, we decided that a fortnight in Switzerland should provide a holiday for all members of the family; mountain scenery, a fresh countryside, and new people for my wife and daughter to investigate, not to mention the possibilities of shopping for both ladies, and microlepidoptera for me. After examination of the various tours offered by the travel agencies, it was decided that we should take a week at Lugano and a week at Interlaken, and the period chosen was the last week of June and the first week of July. Travel facilities proved to be most comfortable with the exception of a rather grim jam in the customs office at Calais; supper was taken while still in the Pas de Calais, and the war scars of Northern France were shrouded by a kindly darkness, the dawn bringing us into the more picturesque hilly country of the West, and we arrived at Basle in time for breakfast at 8 a.m.; this was a delicious meal of heavenly coffee, crisp rolls and such cherry jam as makes the subject of the pleasantest dreams.

Here we left the French train and boarded the Swiss electric train for Lucerne where lunch was already ordered for us by the travel agency. After this meal in congenial surroundings of a roofed-in garden, we took a short walk across the bridge which spans the narrow part of the lake, to the cathedral, and then joined another train for Lugano, which provided us with some very fine mountain scenery, including our first snow-capped peaks, Mount Pilatus behind Lucerne, having been hidden in cloud. The end of our journey was reached about 7 p.m. where we were met by the travel agency hostess, and escorted to our quarters, which proved to be close to the foot of San Salvatore, the hill to the western end of the town.

After a rapid settling in, and a welcome meal, we set out to prove our vicinity; light was failing and only a short walk was undertaken, along the lake-side road away from the town, and one or two tortricid moths were observed flying at the roadside, *Epagoge grotiana* F. being the most in evidence.

As entomologists will remember with grief, 1948 was about as poor a year both for weather and insects, as can be remembered by the younger generation, but the net result of this collecting holiday produced something over 300 specimens representing about 135 species; it is not proposed to make of this account a mere catalogue of species, but some mention must be made of some of the more interesting captures.

The following day I had to make a business call in St Gall, on the north-east corner of the country, which necessitated a whole day's travelling, and no entomology, but on the Sunday, an exploratory visit to the top of San Salvatore was undertaken. Here, I was surprised to see *Papilio machaon* L. flying round the restaurant which occupies the crest of the hill, and in the short survey of the ground at the top, one of the beautiful bronzy-green *Coleophora* species (so far undetermined) was found in moderate numbers flying over the flowers of a tall yellow composite, rather reminiscent of our Nipplewort. Of butterflies there seemed to be little variety, the solitary stately *machaon* circled

its domain, and some black coloured Hairstreaks, probably *Thecla w-album* Kn. flirted in pairs among the bushes. My activities were followed with some interest from the cafe above, and when I released a pair of the hairstreaks which I had netted for inspection, the derisive laugh, which argued failure to appreciate the motive behind this action, showed that at least I had caused the onlookers some amusement. One of the "black" burnets, *Syntomis phegea* L., was also flying but there was little else to take home with me on this trip. A beautiful vermilion-orange fiddle-bug was flying amongst the flowers. On the way up, however, I had noted that the rich herbage of the lower slopes was a hive of activity, and decided that next time, I would leave the funicular at the first stop and work my way up.

This proved to be the best way to work, and on leaving the railway I was at once in the midst of a busy colony of the beautiful *Crambus craterellus* Scop. busily flying between the grass bents; *Crambus pratensis* L. was of course, everywhere. On leaving the road, which descended again after reaching a farm, I took a very rough lane which struck up the hill to serve a few meadows, and then degenerated into a very steep and stony track. At first the most noticeable inhabitants of the overhanging bushes were various *Argyresthia* species, chiefly *A. ephippella* F., but on the rough track I was delighted by the first *Oecophora bractella* L. I had ever seen alive, and so taken was I with its beauty that it escaped from the net twice before being safely lodged in the pillbox. This road was beset by the sweet-scented Cyclamen, and insects were forsaken for a few moments while I gathered a bunch of the flowers for my wife.

Up to this point I had had the road to myself since leaving the farm, but here I encountered a party of misguided ladies who had made the ascent by funicular, and who were attempting the descent in high-heeled shoes of very light pattern. Although my pity was aroused for their plight, there was little I could do for them but direct them to the funicular station a short distance below.

The road now led out on to a small plateau, and here I came on *Idioglyphis inopiana*, Hw., *Tortrix paleano*, Hb., an *Ancylis* species, and other Tortrices, and also a *Crambus* new to me which I have since determined as *C. lucellus*, H.-S. As the bushes once more narrowed the lane, I took *Agrotera nemoralis*, Scop., which species I have yet to meet at home. Finally, with my pillboxes filled, I reached the summit, to make the return journey by funicular. Here it might be advisable to impress on would-be mountain collectors that it is much less tiring to the feet to climb than to descend.

In the evenings, we made a practice of visiting the town, I with pillboxes for the removal of such moths as were found sitting on the illuminated shop windows. Several interesting insects were taken in this way, including my first and only *Aglossa caprealis*, Hb. (= *cuprealis*, Hb.), which taught me a lesson by feigning death in the pillbox, resurrecting itself at a suitable moment while being inspected, skipping to the ground, and slithering away into some dark hiding place to which I was unable to follow it.

Euxanthia zoegana, L., was a very frequent visitor to these shop windows, its numbers being greatly superior to those of *E. hamana*, L., the commoner species in this country, in fact, I only took two specimens

of *hamana*, both of which were of the bifasciated form which is uncommon here. The Tinaeidae were well represented and some interesting specimens, unfortunately not yet determined, were taken. *Plutella maculipennella*, Curt., was omnipresent at all levels in all places worked, and will not be mentioned again.

Next, the eastern end of the town, Monte Bre, was investigated, and the first walk, round the base by the lakeside path, was not particularly productive of a large variety of species, but none the less much of interest was found. On the rocks, particularly under overhanging ledges, the larval cases of a *Meesia* sp. were found together with one or two various Psychid cases, and several ? *Solenobia inconspicua*, Stt. One of the Meesias emerged on my return home, but all the other cases produced only parasites. One or two *Hyponomeuta* webs were found on plum bushes, from which *H. cognatellus*, Hb., was eventually bred, and one or two *Mesographe verbascalis*, Schiff., were netted. On a *Genista*, the black shiny cases of *Coleophora vibicella*, Hb., were found, and on *Helianthemum* large brown Coleophorid cases, probably *C. ochrea*, Hw., were taken but, regrettably, these too proved to have been parasitized. The *S. phlegaea* were plentiful along this path, and at the lake level, *Leptidia sinapis*, L., was flying, and the continental large white form of *Coscinia cribrum*, L., was also taken. At one place where a landslide of a previous age had given rise to a turfy slope, several blues were to be seen, as also one of the green hairstreaks, and the large *Satyrus circe*, F., was to be seen flying rapidly, high up, and settling occasionally on the precipitous rocks to display its prominent whitish bands.

The next expedition was to the top of Monte Bre, by way of the funicular. The very summit proved to be private ground, but a slope between the head of the funicular and the road provided a fine spectacle, with many *P. machaon*, *Pararge galathea*, an occasional small Argynnid, and many burnets. Following the road round, the bronzy *Coleophora* noted on Salvatore, was noted here flying round the flowers of the same composite. The path then descended through bushy scrub and the beautiful *Hypercallia christiannana*, L., was beaten out, together with *Crambus hyrciniae*, Heinemann (= *myellus*, Hb.) and *C. lucellus*. Lower down, near to the station for rejoining the funicular, was a colony of *Tortrix viburnana*, with the males flying strongly, and though only two females were traced, others were without doubt well concealed in the herbage. Crambids were also in plenty here, but apparently all *C. pratellus*.

An excursion to Milan by coach was pleasant enough until the autostrad was reached, but here a steady rain began to fall and was with us on and off along the forty dreary miles across the plain of Lombardy. In Milan, the beautiful cathedral, and the art treasures were inspected; the ladies then buried themselves in the shops. On the outward journey, many blues and browns were noted flying at the roadside of the hilly frontier land, and one was shown the ground where the constant war takes place between the Swiss troops and the smugglers, an unpleasant reminder that "only man is vile."

Our final outing in the Lugano district was a walk from the top of Salvatore to Morcote, which provided more fresh species, particularly a largish Psychid which was flying among the roadside grasses, and the beautiful *Asopia regalis*, Schiff., of which a single specimen was taken

flying strongly over the herbage. On this walk the Tortricidae were strongly in evidence; *E. hybridana*, Hb., and *E. rectifasciana*, Hw., were both taken, and their comparison should easily clear up the confusion of names for our species, which is indubitably *rectifasciana*. At one part of the road which was cut in the hillside, the downward slope was edged with stone posts about three feet high, at intervals of about eight feet, and on each of these sat one of the beautiful green lizards which were to be seen in pet shops here in pre-war days. As one reached the post before the occupied one, the occupant took his cue and was gone in a flash of blue, green and gold.

No night work in the field was undertaken, but I have no doubt that the use of a petrol or paraffin incandescent lamp would have produced an exceedingly large bag.

Early the following morning, we left this delightful town for Interlaken, via Lucerne, and arrived in time for dinner on a wet and depressing evening. We retired early, and awoke to a magnificent view of the Jungfrau from our window; we decided there and then that this mountain should be visited on the morrow, but heavy rain frustrated the project. Instead, we tried the Harder on the north side of the town; my wife and daughter went up by the funicular, and, walking along the ridge, were regaled by the sight of a large mass of the globe ranunculus. There was a queue for the funicular, however, and I decided to walk up, reaching the head of the funicular as the ladies were ready to descend. On the way up, I took the pretty little Gelechiid, *Rhinosia sordidella*, Hb., flying in the roadside vegetation, and one or two oddments; the sight of a large *Acer pseudoplatanus* infested by a *Gracilaria* species was most striking, for at all levels a very high proportion of the leaves were rolled into loose bags to accommodate the larvae. A selection of the most mature looking leaves was taken, but unfortunately the leaves proved difficult to keep, and dried up very soon; only two adults were bred. The report of the flowery ridge, given by my wife and daughter decided me to make another expedition on the morrow.

Here again, I was to some extent frustrated, for there was a heavy fall of snow in the night on the high ground, and when I reached them, the *Ranunculus* were bent and bedraggled. The large grey *Onephasia alticolana*, H.-S., was beaten out of the spruce trees which lined the path, and where these gave place to a steep rough grassy slope, *C. argentana*, Clerck, and *Crambus conchellus*, Schiff., were taken in fair numbers; there were also a few *C. coultonellus*, Dup., and *C. lucellus*, H.-S., various Zygaenids, and a few *P. galathea*, L., and *Melitaea didyma*, O. ?. This slope, with its wet snow, was too treacherous for much activity without mountaineering boots.

The afternoon outing was to Wilderswill, where a small recently cut meadow was worked. This produced nothing new to me, but the usual species, *Pyrausta cespitalis*, Schiff., *P. nigrata*, Scop., *P. purpuralis*, L., *Crambus pratellus*, Hb., *C. cespitellus*, Hb. (= *hortuellus*, Hb.), *Pancalia litreillella*, Curt., *Chalonia aleella*, Schultze (= *tesserana*, Schiff.), *Eucosma fractifasciana*, Hw., *Ancyliis unguicella*, L., and a *Stomopteryx* ? *taeniolella*, Z., were well in evidence.

The final outing, which commenced in poor rainy weather which cleared as we reached our objective, was to implement our decision to visit the Jungfrau. On arrival at Kleine Scheidegg, the terminus of

the track railway from Lauterbrunnen, my wife and daughter boarded the final train which would take them to the Jungfrau-joch, while I started off downwards by the track, for Wengen, whence I intended to entrain at the end of my collecting. This proved to be the most interesting day's collecting I had enjoyed; the surroundings at this high altitude were quite new to me; snow was lying at Scheidegg, and a little below it, but the sun was giving a glowing heat which made one think that the snow had no right to be there. My first capture was *Argyro-ploce schultzi*ana, F., which is what one might expect at this altitude, soon followed by *Acompsia cinerella* Clerck, then, flying very rapidly over a mass of shale on which grew creeping masses of the bright purple and orange *Linaria alpina*, I saw a moth which was quite new to me; I was able to net three specimens, which were shining sooty-brown with golden yellow cilia, later determined as *Catastia marginea*, Schiff., a reasonably common species at this height. On this bank there was also a beautiful clump of *Gentiana verna* in full bloom; unfortunately at this season, *G. acaulis* was finished, and the best blooms found were past their prime. As the path descended, heather gave way to the Mountain Rhododendron, and here I took series of *Pyrausta uliginosellus*, Steph. (= *alpinalis*, Schiff.) and *P. rhododendronalis*, Dup., also *Scoparia sudetica*, Zell., and *S. murana*, Curtis. Several plumes were also taken, of which *Stenoptilia peliodactyla*, Stein, and *Oxyptilus ericetorum*, Stt. (? Zell.) are the only two so far determined. *S. graphodactylus*, Tr., is possibly another species. Here *Argyro-ploce rivulana*, Scop., was naturally in large numbers; *A. bipunctana*, F., and *A. micana*, Hb., were taken and also a single *Eucosma grandaevana*, Z. On this slope the butterflies began to appear; first came *P. machaon*, which species seems to prefer high ground on the Continent, and one or more of the large grey skipper species. Here I saw my only *Aporia crataegi*, L., and on the banks of a small stream, where there was a brilliant green turf and many wild flowers were blooming, blues, coppers and small fritillaries, with occasional *Cidarias* were plentiful. *Pyrausta terrealis*, Tr., was netted on the edge of the wood above Wengen, and filled my last pill-box. *Crambus coultonellus*, *C. lucellus*, *C. pratellus* and *C. cespitellus* were flying in plenty on the Rhododendron slope, and the little mountain Alder, *Alnus incana*, gave mines which later produced *Lithocolletis strigulatella*, Z. On reaching Wengen station rain once more commenced to fall, and after possibly the most enjoyable day's collecting of my life, I settled down without regrets, happily tired, to take tea at Lauterbrunnen and then on home to Interlaken.

This was the last outing of my holiday and the next morning we set out for home. The weather of the Lugano week had been most kind, but the Interlaken rain and snow curtailed collecting to a disappointing degree. However, we returned home feeling that this had indeed been a holiday of note.

ENTOMOLOGICAL EXPERIENCES IN WEST AFRICA, MAINLY TOGOLAND, FOR THE PAST FIFTEEN YEARS.

By Major F. O. JOHNSON, M.B.E.

I. (Received in July 1946.)

I wish to thank you for your letter of 17th June, which I received to-day. I appreciate it very much.

I shall most certainly send you notes, observations, etc., which you can publish with pleasure if you consider them of sufficient interest.

It must be most interesting to study local variation, aberration, etc. Unfortunately there are no *cardui* here, and as I know very little about moths I do not know if *aurifera* is found in Togoland.

I have not the time to do much collecting, but I employ an African who is very keen. On long runs in my car my driver keeps his eye glued to the road when it is sunny, even at high speed he gets very agitated when he sees an interesting butterfly. The car stops, except when I am in a hurry, which is usually the case. Then the driver tells me what I have missed, and he is away with a net, unless I get there first. I find nets of about 2 ft. 6 ins. in diameter necessary.

My district comprises Addah, Akuse both Southern and Northern British Mandated Togoland, and I sometimes have to go to Palime in French Togoland on business. Some of the country is very hilly, and there are passes. On the way to Palime it is 750 metres, and there is a fine waterfall, many ferns, etc. Many species of butterflies on hot days fly in the spray, and emerge very wet. They seem to enjoy it, but when the sun is in they all disappear, as it gets very cold there. The blue *Salamis* look very fine in the sun there, but in other parts keep to the bush.

In the Belgian Congo I saw the endless processions, like a blizzard, of *Cymothoë caenis*, but in Togo there seems to be more females than males.

In Congo I very much wanted *Charaxes hadrianus*, I showed the picture in "Seitz" to an African who had never worked except farming, and certainly never collected butterflies. He said he knew *hadrianus*, and as proof brought me fifteen fine males, all living. But here it is not so simple.

There are a number of interesting variations and dwarf forms here, if you would like them, I will send you specimens I consider of interest. You might not have them in your collection.

In Papilionidae, there are of course variations in *P. dardanus*, and the only female form I have found here—*hippocoön*, varies quite a bit. On the wing it is very like *Amauris niavius*, but of course much lighter. There are dwarf forms of *demodocus* and *nireus*; and *leonidas* varies greatly in size and in colour—they seem to approach to ab. *onidale* (in Seitz) and one I have is *onidale*. I was amused to see late one afternoon a solitary *leonidas* busy feeding in the middle of a cluster of *Amauris egialea* and *D. petivisaria*. Exact mimicry. I have a *leonidas*, and a *Salamis anacardii* with one forewing very much smaller than the other, but apart from that quite perfect. *Phorcas* usual female is here also form *thersander*. Some males of *pylades* are quite small, some as large as the female. *Policenes*, *liponesco*, *antheus* and *evombaroides* vary in

size and in the green colour. I have not seen the large clusters of *Papilio* and *Pieris* I used to see on the banks of the Kassai river in Congo, but it is amazing to see the immense swarms of *nireus* and *demodocus*, including their females, simply going mad and fighting on the "flame of the forest" trees, they get quite red from the brilliant red (flowers) pollen. They seem to get intoxicated, and too full even to fly. *Pylades* sometimes joins them. *Papilio adamastor*, *agamædes*, *almansor*, etc., seem almost to merge, and some are hard to distinguish. I have found only two *menestheus*, although it should be common. *Zenobia* and *cymorta* are uncommon, *nireus* is much commoner than *bromius*.

I have not long been released from the Army, so it may change when I have been in this district a whole year. I am keeping rough notes of the months in which the various species appear.

PIERIDAE.—*Leptosia narica*, *Mylothris chloris*—variation in colour and size both male and female. *Spica*, fairly constant—one female I have is quite yellow. *Poppea* varies a bit, especially in size. *Creona*—fairly constant, one female very yellow. *Calypso* is most interesting, I have a dwarf form, the males vary in the amount of black on the forewings, but the females vary from almost white to yellow until almost black. The yellow on the underwing on the reverse side is much brighter in some newly emerged specimens. I have had a number of *rhenia*, little variation really, and have just got one *hedyle* to-day. *Teracolus evippe* and ab. *ocale* vary greatly in colour and size, some are almost the size of a small blue. *Eronia thalassins* vary, but of course *argyria* is the most astonishing. I have the following female forms—*sulphurea*, *semiflava*, *idotea*, *poppea*, *virescens* and *mixta*. They are my favourites, I think. *Catopsilia* show the usual variations, the females deep orange. *Terias* I have not had time to sort out.

DANAIDAE.—No *chrysippus*, although the female form of *Hypolimnastis misippus* is much more common than *alcippoides* and *inaria*. Perhaps I shall get *chrysippus* later in the year. *Alcippus* varies greatly in the amount of brown, or brown-yellow, on the hindwing. The forewings are sometimes red, and often deep brown. I have dwarf forms—exceedingly small, some are as large as *archippus*. *Petiverana* does not vary very much; nor does *Amauris niavius* except in size and in blackness. *Egialea* varies a lot, in size and the extent of the brown on the hindwing. It is much more common than *hecate*. *Egialea* comes out whenever the sun goes in, at all times of the day—sometimes in the dusk.

NYMPHALIDAE.—*Euxanthe eurinome*, not common. *Charaxes epijauius*, only males as yet. *Castor* appear very large, *zinga* not common, males, and about the same number of females. *Etesipe*, more females than males. In the Congo I found female *charaxes* difficult to obtain, but here it is much easier. *Protoclea* of course, and *cynthia* same amount of females as males. *Lucretius*—only males so far. I have a specimen I cannot determine, it is something like *saturnus*, but the tails are very long, there is a lot of white where the orange markings taper off, and the abdomen is white, tails and hind margin are very blue. It is not like *pelias*, and I am sure it is not a form of *saturnus*. *Numenes* male and female are not common, but *tiridates* is fairly easy to get. I have quite a number of fine females. Both male and female vary, but I am certain none are really *bipunctatus*. The yellow hind margin varies quite a bit, some have a yellow triangular marking high up. Actually

it is not so common, but my boy collects in very thick bush and that is where the shy females are found. Occasionally I have caught female *Charaxes* in bright sunshine, but not often. There are varieties of *etheocles*, *hollandi* and *carteri*. I got a very fine series of all kinds of *etheocles* in Congo, also *mechowi*, which is rare. *Candiope* is fairly scarce. *Vologeses* varies enormously both in size of male and females, and on the underside. Quite as much as *Salamis cacta*. *Fulvescens*—I have obtained one only, beautifully marked—it almost looks different. *Eupale* is not common, and although I got *zelica* and *doubledayi* female in Congo, the only one of this type I have found so far is a female *laodice*. *Palla decius* I can find only in one small locality, but I have got a number of fine females, not all *decius*. I did not get a female *Palla* in Congo. *Cymothoe theobene*, females only; I have seen only one male. *Degesta*, female ab. of *egesta*, I have found. *Caenis*, more females than males to date. *Sangaria*—males and females. *Euryphura* and *Diestogyna* I have a number but have not finished classifying them, some of the Cameroon forms mentioned in Seitz are certainly here. I may have some new kinds. This applies also to *Euryphene*, *sophus* female is more obtainable than the male, but loves the darkness under the trees like *Euphaedra* and *Aterica galene* and *demophon*. The males of *Aterica galene* seem almost to scuttle about like beetles. I have found that it is useful to be ready at a forest trail and get an African to make a big commotion in the bush, then the *Euphaedra*, etc., fly out, but still are not easy to catch as the net fouls the leaves and branches. One has to be patient. *Euphaedra eupalus*—very large, *madon*—varies quite a bit, also form *agnes*, etc. *Xypete* is not common, nor is *cyparissa*. *Themis* varies enormously, the females are very fine, and some very large. There is *janetta* also. *Ceres* are very variable, especially females with white band and yellow band. Some are very large, *ravola*, *praethusa*, etc., are found. I have not seen *ianum* yet, but have got *edwardsi* male and female. *Hamanumidia meleagris* very common, also *Aterica galene*. *Meleagris* skims on the surface of the roads, and is very wary. *Catuna erithea* in dark places in woods with *galene*, etc. *Pseudoneptis coenobita*—bright sunshine. I have a few *Pseudacrea*, but mostly *lucretia*. I got some good ones in Congo. *Neptis* vary in size, have not determined them yet. *Cyrestis camillus* loves skimming on the surface of roads in the sun, as *meleagris*, it is not easy to see at rest with wings outspread. *Byblia lithyria* loves the sun on the grass, like *Precis westermanni*, *hadrope*, etc. *Ergolis enotrea* and *Eurytela* are difficult to catch, for no apparent reason they fly in sudden spurts into the leaves. *Enotrea* is often found torn not by lizards or by birds, but through contact with leaves and twigs. By the way it is amusing to see a lizard following up a butterfly on a road surface, the lizard is nearly there, when the butterfly flies ahead and again rests. The lizard often gives up the chase in disgust. I found cats are very swift, and leap up and catch butterflies and moths. I have mentioned *Hypolimnas misippus* females, males and females fly on to grass from a cassia tree, the male especially suns himself and flaps his wings until he sees a female, and then they fly off at great speed high in the air away from the tree. *Salmacis* males and females are much finer than those of Congo, both in colour and in size. Apart from great differences in size of specimens, *anthedon* and *dubia* vary little, not as much as in Congo. *Catacroptera* mixes with *Precis*, some

of the females are brilliant and large. *Precis stygia* likes grass. *Tereu* forms prefer open paths. *Octavia* is rare, but very fine. *Westermanni*, only males so far, is common on grass at sides of paths. *Clelia* is very common, and *hadrope* male is much more common than the female. *Lachnoptera iole*—none. *Atella columbina*, great variation in size, colour, etc.

ACRAEIDAE.—Many species and variations.

LIBYTHEIDAE.—More strongly marked than in Congo, and larger.

SATYRIDAE.—Fairly rare except the very small ones.

LYCAENIDAE.—I have *apicalis* types, also *Pentila*—red ones. Types like *posthumus*, beautiful tailed blues like *caesareus*, but I have not had time yet to identify them.

HESPERIDAE.—Not determined yet, many fine forms. Difficult to set perfectly.

I have mentioned only some of the kinds I have obtained here, but it gives an idea of the richness of the district. I must confess that in the Belgian Congo I got practically all one could expect to find there, and very rare species. Perhaps when I have been collecting here for a year I shall find it equally interesting. Each day my collector brings in something new, I find it is better to have one good man than many amateurs. I send the collector to different localities, and when I am on trek and have my work to do—which takes me all my time, it certainly is very pleasant to see his catch always. Setting occupies my spare time in the evenings. I set only the species and forms I want for reference.

My collector is careful to examine a specimen to see it is perfect before killing it, which is a good thing. I hope to rear some *Charaxes* later, but although I get living females they do not seem to like my idea of a suitable food plant. Obviously they do not always hover round the food plant.

I do not know much about moths, but have good hawk moths, and interesting *Saturniadae* which I sometimes find in the darkness under forest trees and bush, when searching for *Euphaedra*.

At dusk, by the way, as soon as the last *nereus* and *demodocus* staggers off from the brilliant “flame of the forest,” flamboyant tree, the hawk moths swoop down and make a terrific noise. Large ones jostle small ones like humming bird hawks, and there are often beehawks, some quite large, battling with *Hesperidae*, during the day to get at flowers, as the humming bird hawks battle with *Hesperidae* at flowers at dusk.

One day perhaps I shall tackle the moths, but the butterflies take me all my time at present. To a scientist Seitz's descriptions may be plain reading, but I find it gives me a headache trying to follow some of the descriptions.

Having been in Congo as well, I find my *Charaxes* for example are almost complete. I have made a special effort to get all the rare *Ornithoptera* (*Troides*), etc., and *Papilios* from Indo-Malaya, and have concentrated on *Papilios*, *Morphos*, and *Heliconias* from America. I think *Parnassius* fascinate me most, especially forms from Thibet and China, Himalayas, etc.

I hope the foregoing has interested you, if there is anything of interest please publish it. Perhaps you would give me some idea of what people require, I have not the time to trace life histories, and although

I had some years of botany, I regret I cannot tell one tree from another; also caterpillars are hard to get. I think Africans generally must be scared of them.

If there are any species with variation I have mentioned which you are interested in, please let me know.

P.S.—Usually when I get a chance to go into the bush to collect, sometimes on Sundays, I find it is necessary to get up very early. Africans tell me many “drink the dew” at 7 a.m., or even earlier. I have seen them about at 6 a.m., which is surprising as later in the morning most disappear when the sun is obscured by clouds. It is disappointing to find on Sunday the sky overcast, and then I wish I were free to collect every day of the week. In the Congo I met the occasional snake in the bush which made me think twice before scrambling after a rare butterfly, but the next day one is as keen as ever. Fortunately I found the snake scared first, but some get annoyed.

Apart from *Charaxes* having the same depraved taste as Purple Emperors, especially the trail left by a dog (excuse me being vulgar) they love places where “elaeis” palm trees are tapped for “Palm wine.” Where this drips to the ground, or is left to ferment, male *Charaxes* are even more keen to get at it than Africans who risk getting the resulting thick head.

(To be continued.)

A MYRMECOPHILOUS APHID PARASITE. (HYM. APHIDIIDAE).

By W. D. HINCKS (Manchester Museum).

Myrmecobosca mandibularis was described by Maneval in 1940 (*Bull. Soc. Linn. Lyon*, 9: 9) from a single female taken with *Lasius niger* (L.) in France. I have just sent off to Sweden a short account of a closely allied species which I reared from the aphid *Tetraneura ulmifoliae* Baker, taken by Mr H. L. G. Stroyan in the runs of *Lasius niger* whilst we were collecting in Linné's garden at Hammarby during the VIIIth International Entomological Congress at Stockholm last August.

It is possible that *Myrmecobosca* may be found in Britain so that a brief note on the little information we have regarding this remarkable genus may be of interest. Maneval concluded that his insect was a specially adapted myrmecophile, a conclusion supported by several interesting facts. His single specimen had the apical portion of the forewings beyond the stigma, and the tips of the hindwings symmetrically nibbled off on both sides. The apical segments of the abdomen are permanently curved under the body and the long legs are carried in such a way as to elevate the body sufficiently from the ground whilst the insect is in motion. In the act of being fed by an ant, as observed by Maneval, the parasite is supported in a more or less vertical position by the truncated wing-tips and the curved aspect of the abdomen. The prominent mandibles and curiously shaped head combine to produce a kind of dew-lap on to which the regurgitated droplet may fall.

The Swedish species agrees closely with Maneval's description but there are a few important differences which have compelled me to regard it as distinct. The wings of all three of these reared specimens are, of course, complete and it is interesting and significant to notice that they

are veinless beyond the level of the stigma and when folded across the back the veinless portion extends beyond the end of the curved abdomen providing an area particularly vulnerable to the mandibular activities of the ants.

The larvae pupate inside the aphid skin in the manner of *Aphidius* and the adult emerges through a circular exit hole in precisely the same way.

It would seem, *a priori*, that the radicolous aphids specially protected by ants are unlikely subjects for parasitic attack but the problems of access are simplified if the parasite is itself an accepted myrmecophile.

COLLECTING NOTES.

PSEUDOIPS BICOLORANA AND DEILEPHILA ELPENOR IN S.E. LONDON.—Mr S. Wakely's mention of *Pseudoips bicolorana*, Fuessl., at Herne Hill (*Ent. Rec.*, 61: 37), prompts me to put on record that the species exists as a rarity in Greenwich Park, where in 1948 a young larva and a single imago were noted on oak. The moth occurs commonly at Shooter's Hill, about 3 miles east of Greenwich Park, and in all the oak woods in N.W. Kent the species is considered as fairly abundant. No doubt there are more small isolated colonies in existence in other parts of S. London.

I might also add that *Deilephila elpenor*, L., is common at Lewisham, Blackheath and Greenwich, where larvae feed on willow-herbs (*Epilobium angustifolium* and *E. hirsutum*) growing on waste ground. I well remember a hot afternoon in July 1945 when I saw about two hundred full-grown larvae of *elpenor* on a bombed site at Lewisham.—D. F. OWEN, 3 Lockmead Road, Lewisham, S.E.13.

MELITAEA CIXIA.—In my note on the Butterflies of the New Forest area in the December number of the Journal, 1948, I recorded this insect as occurring in fair numbers quite close to Sway and took a few specimens on the 12th May. To watch its development, I visited the locality on two occasions, in late March and again in early April to see if there were any larvae to be found. I regret to report that the best spot has been completely destroyed by the Railway Company's extensive repairs to the line and embankment, which has been going on for some months. Earth has been deposited over a comparatively wide area and in addition to this fire has done more destruction elsewhere. I was not surprised, therefore, in finding no larvae. Further, I could find very little of its food-plant, *Plantago lanceolata*, the narrow-leaved plantain, anywhere, but it is hoped the insect has more widely distributed itself in last season and that I shall find it again not so far away from the old site. In due course a further report will be made.—CHAS. B. ANTRAM, "Clay Copse," Sway, Lymington, Hants, 29/4/49.

AN EARLY SEASON.—The recent appearance of certain species points to an early season. Besides the usual hibernators, the Holly Blue, Orange Tip and Pearl-bordered Fritillary have been taken in this district. A freshly-emerged female of *Colias hyale* has already been re-

corded as seen at Swanage on the 1st of April and I have seen a *C. edusa* here on about the same date. In Bournemouth a freshly-emerged Pine Hawk moth was taken at rest in a tree trunk in Easter week. These early appearances are no doubt owing to the past mild winter and the phenomenal heat-wave round about Easter.

It goes without saying that weather conditions in the winter and particularly the early months of a year greatly influence the prevalence or otherwise of insect life. Except for a gloriously fine May in 1948, June and July were so wet and cold without any long spells of fine weather, this most certainly resulted in the scarcity, among others, of many of the commoner species. It was particularly noticed that *Arg. paphia* and *Lim. sibylla*, usually so numerous in the New Forest in July, were very scarce.*

In the early months of this year the ordinary seasonal progression of weather has been strangely upset. For the first time since 1937, March was a colder month than December, January or February in many Southern districts of England and over most of the country the month provided less sunshine than February, a rare happening. At Easter, however, the temperatures on some days were well over 80°, breaking all records for the past 100 years.—CHAS. B. ANTRAM, "Clay Copse," Sway, Lymington, Hants, 29/4/49.

EARLY SPRING EMERGENCES, 1949.—The alternating warm and frosty spells of this Spring has resulted in a few species emerging early, others being normal or even late.

Phigalia pedaria was at light on 8/1/49, but continued rather scarce.

Erannis leucophaearia on tree trunks, 24/1/49, much rarer than usual.

Erannis marginaria also quite rare and patchy, first seen 24/2/49 at light.

Apocheima hispidaria rarer than usual—first seen, a ♂ drying its wings on 13/3/49, rather late.

Orthosias were mostly in smaller numbers than usual, exceptions being *O. munda* abundant at sallows on 22/3/49 in wonderful variety of forms, var. *immaculata* being about 20%. Also *O. populeti* made a welcome appearance for the first time in my experience.

Cyenia mendica. A ♂ came to my light trap on 22/4/49, very early, together with *Pheosia tremula* and *Notodonta zic-zac*.

Argynnis euphrosyne. A ♂ seen on 9/4/49, over a fortnight earlier than I have ever seen it before; only one, however, seen since.—COM-MANDER G. W. HARPER, R.N. (Retd.), 28/4/49.

HIBERNATING LEPIDOPTERA, 1948-9.—This winter has been completely without lying snow on the Sussex coast, and has consisted of alternating very mild and cold frosty spells. With the exception of *Vanessa atalanta*, a few of which usually hibernate here, appearing on mild January days, all other usual hibernators have been seen this Spring as follows:—

Nymphalis polychloros. Three individuals seen between 1/4/49 and 14/4/49. One of these returned twice to bask in the sun on the white woollen sleeve of my daughter's jumper!

Nymphalis io and *Polygonia c-album*. Common everywhere.

Aglais urticae. Rare. It was also scarce last Autumn.

Vanessa atalanta. Not seen at all.

Gonepteryx rhamni. Abundant.

Conistra vaccinii and *Eupsilia transversa* exceedingly and unusually abundant at sallow blossom, as at sugar also in November 1948.

Lithophane socia and *Graptolitha ornithopus*. Not uncommon at willows.—COMMANDER G. W. HARPER, R.N. (Retd.), 28/4/49.

SPRING DIPTERA, 1949.—Spring Diptera here are at last coming out. They were late here, due possibly to lack of moisture, probably due to lack of rain. Certainly the wild flowers were long before the flies I usually associate with them.—H. W. A., 19/4/49.

SPRING RECORDS, 1949.—I hope all or some of the following dates of imagines taken near Southampton may be of sufficient interest for publication under "Collecting Notes" in the *E.R.*:—

| | | |
|----------|-------|--|
| Mar. 14 | ..... | <i>Diurnea fagella</i> (2). |
| „ 17 | ..... | <i>Xylocampa areola</i> (2). |
| | | <i>Achlya flavicornis</i> (commonly). |
| „ 19 | ..... | <i>Semioscopis avellanella</i> (1). |
| „ 25 | ..... | <i>Ectropis bistortata</i> (commonly). |
| „ 28 | ..... | <i>Orthosia miniosa</i> (2). |
| April 25 | ..... | <i>Apatele rumicis</i> (3). |

—A. C. R. REDGRAVE, 14a The Broadway, Portswood, Southampton, 29/4/49.

LEPIDOPTERA IN JANUARY AND FEBRUARY 1949.—It may, perhaps, be of interest to mention the first dates when some of our early Lepidoptera were seen by me at Weston-super-Mare during the first two months of this year:—

| | | |
|---------|-------|------------------------------------|
| Jan. 27 | ..... | <i>Phigalia pedaria</i> . |
| „ 30 | ..... | <i>Alsophila aescularia</i> . |
| Feb. 7 | ..... | <i>Gymnoscelis pumilata</i> . |
| „ 10 | ..... | <i>Erannis marginaria</i> . |
| „ 12 | ..... | <i>Erannis leucophaearia</i> . |
| „ 14 | ..... | <i>Colostygia multistrigaria</i> . |
| „ 18 | ..... | <i>Biston strataria</i> . |

The date for *P. pedaria* is not unusual but that for *A. aescularia* is early, though this species is usually out in the middle of February as long as the weather is mild. *G. pumilata* on the 7th of February is about a month earlier than usual. *E. marginaria* and *E. leucophaearia* emerged at about the usual time. My earliest date for *E. marginaria* in former years is the 30th of December 1945, which was, of course, exceptional.

14th February for *C. multistrigaria* is early, as is 18th February for *B. strataria*; my first date in previous years for the latter is, however, 6th February 1943.—C. S. H. BLATHWAYT, "Amalfi," 27 South Road, Weston-super-Mare, 29/4/1949.

CURRENT NOTE.

It is with deep regret that we record the decease of L. W. Newman, of the "Butterfly Farm," Bexley, Kent. He was a dealer remarkable for his honourable and straightforward business methods. Reliable and reasonable in exchange, he was trusted by his many schoolboy clients. He never tempted the ignorant with foreign material as was the custom of the dealers in the previous generation.

OBITUARY.

WILLIAM FASSNIDGE, M.A., F.R.E.S., OFFICIER D'ACADEMIE.—On Tuesday, 19th April 1949, William Fassnidge died at the age of 61, after a long and gallant struggle against ill health, and his very large circle of friends has suffered a most severe loss.

Fassnidge's entomological interest dates back to his school days, and his active mind would not be cramped by insular boundaries, so that he spent many holidays in various parts of Europe, collecting local lepidoptera, compiling an extensive collection of palaearctic lepidoptera, including the "micros" in which he had a special interest. His collections and his extensive knowledge were always at the disposal of any entomologist who had need of them, and when the enquirer came from afar, the hospitality of the house was offered as well. Such was the unselfish nature of our friend that while he would rarely accept more than two or three specimens of a species he required, anything required by his visitor was pressed on him, even though Fassnidge's series was none too long. Very many entomologists, both foreign and British, have enjoyed his hospitality and have gone away enriched in knowledge and gratified by the warmth of his welcome.

As a field worker he was tireless, and knew the localities around Southampton so thoroughly as to be able to offer valuable assistance to the visitor, and providing he was satisfied that his visitor's interest passed the narrow bounds of the mere "collector," no knowledge was withheld, and the visitor was made free of the locality for the insect required.

Fassnidge took a particular interest in the variation of *Peronea cristana*, and he was a tireless worker in the pursuit of this insect, which, as is known to those who hunt it, is a most strenuous occupation, and even in his last season he would overtax his strength unless restrained. He was particularly generous to his friends in the matter of good forms of this insect, and if working with a guest, that guest had the first choice of the bag.

He joined the South London Entomological and Natural History Society in 1924, and the Royal Entomological Society in 1925, representing that Society on the New Forest Joint Committee from 1939, and he was also a member of the New Forest Association. He was a founder of the Society for British Entomology, and gave valuable service in the compilation of local lists published by it. He also served on the editorial panel of the *Entomologist's Record*, and his wide know-

ledge of foreign languages made him a most valuable colleague, especially in the translation of descriptions of species, his translations being most reliable. From time to time, he communicated notes to the *Record*, and also to *L'Amateur de Papillons* and other entomological journals.

Fassnidge was educated at Dr Channer's Grammar School, Amersham, Bucks, and at St Mark's College, Chelsea, taking his London M.A. externally. He was honoured by the French in recognition of his association with the Alliance Francaise. He came to Southampton in 1915 as a modern language master at the King Edward VI Foundation School, where he worked for thirty years, becoming senior language master and eventually second master of the school.

He served as a lieutenant in the King's Liverpool Regiment during the 1914/1918 war, and when evacuated with his school to Poole during the 1939/1945 war, he served again as a lieutenant in the Poole Home Guard Unit, and it was while attending a demonstration of attack by fighter aircraft that he was severely wounded by a spitfire whose pilot mistook the line of spectators for the target line of traffic set up for the demonstration; he received a bullet through his lung and another through his arm which damaged the main artery, and although he was given but two years to live, his mental and physical vitality coupled with the unceasing care of his wife this short period extended to something over six years. His activity in the field was naturally curtailed as a result of his injuries, but he carried on to the best of his ability, and afforded to many of his friends some unforgettable days in the beautiful forest- and down-land surrounding his home.

The hospitality of Mr and Mrs Fassnidge was not confined to entomologists; he was a member of the Modern Languages Association, the Franco-British Society, and the local Alliance Francaise of Southampton. His kindness did not stop at realizing the need for help, he saw to it that his sympathy found a practical outlet; in the days of persecution in Germany prior to 1939, many a refugee found two or three days' shelter with these hospitable hosts, while contacting friends or relations in this country, and the same facilities were extended to foreign students arriving in Southampton, while they sought suitable quarters of a more permanent nature.

That his efforts in the cause of international friendship did not pass unnoticed is evidenced by his French decoration and by the fact that the consuls of both Spain and the Argentine Republic attended his funeral, and together with a large gathering of friends and colleagues saw him laid to rest in South Stoneham cemetery, in the heart of the countryside he loved so well.

He leaves a widow, one son, and two grandchildren, and to all of these we extend our sympathy, but most of all to the grandchildren, who are too young to have much recollection of the happiness engendered by the company of their grandfather; the older ones will have their memories for comfort.

Let us hope that something of his kind nature will have been planted by him in his circle of friends, that his good work may not end with his untimely death, for there is plenty of scope for them in the world as it is to-day.

S. N. A. J.

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ACTIVITY AND MORTALITY OF *PIERIS RAPAE* IN AMERICA, AFRICA, AND EUROPE.

By ORAZIO QUERCI and LYCAENA ROMEL, M.D.

(Continued from p. 37.)

TABLE II (1).

Behaviour of the different stages of *Pieris rapae* in some conditions of climate and environment, at Philadelphia.

HUMID GROUND.

VEGETATION, SUNSHINE.

- (a) Above 75°, if the solar rays are strong, eggs hatch in 4 days. Some caterpillars form pupae in 7-8 days, others delay a little. Some pupae produce adults in 7 days, others, gradually, during the following week. Almost no larvae collapse.
- (b) Between 65° and 75° duration of larval stages is delayed if the solar rays are feeble.
- (c) Below 65°, with feeble solar rays during some days, eggs dry, larvae collapse, pupae fall into lethargy.
- (d) Below 60°, even one night only, those larvae that had remained long without feeding owing to scarcity of plants, die.

SUNSHINE, LACK OF VEGETATION.

- (e) Above 70°, if the solar rays are strong, larvae resist starvation at least 10 days. Meeting with food, they grow and can form pupae.

VEGETATION, LACK OF SUNSHINE.

- (f) Below 75° during the day, and 65° the night, all stages are inactive.

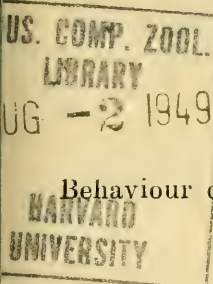
DRY GROUND.

VEGETATION, SUNSHINE.

- (g) Between 50° and 60° scanty activity in any stage.
- (h) Between 60° and 75° activity increases. Feeblest larvae collapse.
- (i) Above 75° the soil becomes more or less hot according to intensity and continuity of the solar rays, and it emits waves of radiant energy. If these reflected radiations are intense they kill the larvae (at Philadelphia) even below 75°. Eggs hatch in 3 days, but the young larvae die almost at once. Some pupae produce adults in 6 days.
- (j) In the above recorded situation, larvae in places where weeds prevent the understanding ground to become hot, survive.
- (k) Thunderstorms, scarce rain followed by intense sunshine. The little water above the soil evaporates rapidly while the air is electrified weeds are no more a shelter because the smell of drying ground ejects the caterpillars out of their hidings. The excited larvae, crawling across the country, are killed by the reflected radiations even at a moderately high temperature of the air.

DEFICIENCY OF SOLAR RAYS.

- (l) Larvae resist high temperature as reflected radiations are feeble.



HURRICANE.

- (m) Heavy rain, strong wind. The frail stems, on which the larvae of *rapae* feed, fall upon the ground. Most larvae drown. Eggs and pupae little injured. Hurricane is one of the most active factors of destruction.

PARASITE.

It seems that America has not imported it together with the butterfly.

ACTIVITY AND MORTALITY OF *PIERIS RAPAE* IN AMERICA, AFRICA, AND EUROPE.

By ORAZIO QUERCI and LYCAENA ROMEL, M.D.

TABLE II (2).

Behaviour of the different stages of *Pieris rapae* in some conditions of climate and environment, at Philadelphia.

HUMID GROUND.

VEGETATION, SUNSHINE.

- (a) Above 75°, with strong solar rays, eggs hatch after 3 or 4 days. Some larvae pupate in 7 to 9 days; a few delay a little. Some pupae emerge in 7 days; others, gradually, a few days later even if they have been formed on the same day. Adults live about a week. Females always lay eggs.
- (b) Between 75° and 65° activity decreases if the solar rays are feeble.
- (c) Below 65°, and with feeble sunshine during a few days, eggs dry, larvae and adults die, pupae become lethargic.
- (d) At about 60° and below, also one night only, those larvae which have remained some days without food, owing to scarcity of food-plants, collapse.

SUNSHINE, LACK OF FOOD-PLANT.

- (e) Above 70°, if solar rays are strong, larvae resist starvation about 10 days. With scanty sunshine they die before.

VEGETATION, LACK OF SUNSHINE.

- (f) Above 90° larvae are very active. At lower temperatures activity decreases. Below 60° all stages are inactive.

DRY GROUND.

VEGETATION, SUNSHINE.

- (g) Above 75° larvae living where the soil, warmed by the sun, becomes hot, die. Only those in places sheltered by weeds, so that the understanding soil does not become hot, resist. Mature ones form pupae even in 6 days only. Mortality depends upon density of vegetation and intensity of the sunshine. Adults, eggs and pupae seem not to be injured.
- (h) Between 75° and 60°, only feeblest larvae, lacking of any shelter, collapse. At about 60° larvae resist and are active. Activity decreases at lower temperatures.

- (i) Storm with scanty rain followed by intense sunshine. The little amount of water, upon the barren ground, evaporates rapidly while the atmosphere is electrized. Vegetation is no more a shelter because the peculiar smell of drying land excites the larvae that leave their hidings and die, even at a moderately high temperature. Eggs hatch after 2 days, but the young larvae die almost at once. Some pupae produce adults also in 6 days. Feeblest chrysalides rot. Adults have shorter life.

LACK OF SUNSHINE.

- (j) Above 70°, eggs, larvae and pupae are active.

LACK OF FOOD-PLANT.

- (k) Larvae can resist starvation a few days if the solar rays remain feeble and the soil is tepid.

ATMOSPHERIC ELECTRICITY.

- (l) Insects in any stage are more active when the ground is damp. Mortality increases if the land is dry.

HURRICANE.

- (m) The frail stems of *Cruciferous*-plants, on which the larvae of *Pieris* live, fall on the ground and most caterpillars drown. It seems that both eggs and pupae are little injured because, according to our collecting data, many pupae continued to produce adults, during a few days, in the field which had been ravaged by the storm.

PREDATORS.

- (n) In the meadow, where we collected, ants were a very active factor of destruction of eggs, larvae and pupae. Sometimes we have seen them dragging living adults. Large outbreak of ants occur when it is hot and the ground is humid, that is just when the development of *Pieris rapae* is favoured by climate.

PARASITES.

We have reared in cages a large number of larvae taken in the field. None of them was affected with mites. It seems that America has not imported the parasites of *Pieris rapae* together with the butterfly.

Note.—With the support of these data, we try to explain the development of *Pieris rapae* at Philadelphia during the season in which we collected them.

(*To be continued.*)

SOME ANT SWARMING RECORDS FROM CO. DUBLIN.

By FERGUS J. O'ROURKE, M.Sc., M.B., B.Ch., B.A.O.

There is still very little information available concerning the swarming habits of the indigenous species of ants. Until there is a considerable body of such information available there is little hope that the factors which control undue swarming will be elucidated. It is hoped

that those who observe swarms during the coming season will record them together with such meteorological information as may be available. I will only be too pleased to receive specimens for identification.

The following records have accumulated in the last couple of years:—

Myrmica rubra (= *ruginodis*).

This species swarmed in some hundreds at Castlekelly, Glenasmole (800 ft.) at 2 p.m. on 29th July 1947.

A swarm of this species numbering a few hundreds occurred at Donabate (sea level) at 5 p.m. on 17th August 1947. I took a single male *M. scabrinodis* in this swarm.

A mixed swarm of *M. rubra* and *M. laevinodis* took place at Castlekelly, Glenasmole, at 2 p.m. on 16th August 1947. The temperature, the highest since 30th July, was 76° F. while the barometric pressure was 30.25 inches.

A major swarm at Castlekelly began at noon on 29th August 1948. *M. rubra* comprised 80.5% of this swarm, which numbered some hundreds of thousands. Other species represented were *M. laevinodis* (2.4%), *M. laevinodis* var. *ruginodo-laevinodis* (7.3%), *M. scabrinodis* (9.7%). A single male *Formica fusca* (0.1%) was taken in the random sample of 759 specimens collected and was the only one of its species seen during the swarm, which continued until darkness fell. Of the 759 specimens collected 94.6% were males, which agrees well with the figures already given for the allied species *M. laevinodis* (O'Rourke 1946) and for *Lasius flavus* (O'Rourke 1947). I have unfortunately mislaid some observations made on the density of the swarm. The maximum temperature during the period of swarming was 66° F. The previous day, however, was the warmest during the preceding fortnight—the temperature was 70° F. by 10 a.m. and reached a maximum of 76° F.

Although this was undoubtedly the major swarm in the area for the year there is little doubt that other swarms took place, for on 8th September my brother Aengus took a trout at the junction of the Slade and Cot Brooks which had a male and a winged female *Formica fusca* in its stomach. This suggests that the Formicine species swarmed later, as is the general rule. On 26th September there were still males to be found in the nest of *M. scabrinodis* in the area.

Lasius flavus, F.

A mixed swarm of this ant and *M. laevinodis* took place on 22nd August 1947 at Castlekelly, Glenasmole, beginning at 1 p.m., when the temperature was 64° F. The swarm was a small one and the numbers never rose above a couple of hundred.

Lasius niger, L.

A small swarm of about 400-500 was seen on the banks of the river Dodder at Dartry on 18th September 1948 at dusk (9 p.m.*). This swarm was of interest as males were fewer in number than females, contrary to the usual condition. I have previously pointed out (O'Rourke, 1947) that after a few hours of swarming this species showed,

at Cambridge the same phenomenon. This is easily explained, as the female *Lasius* take much less readily to the wing than do the males, who are thus more likely to get dispersed during swarming.

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- O'Rourke, F. J. (1947). "*Lasius* spp. swarming at Cambridge." *Ent. Mon. Mag.*, 83, 41-42.

* All times given as Greenwich Mean Time. *

LEPIDOPTERA OF WEST SUSSEX, 1948.

By Commander G. W. HARPER, R.N. (Retd.).

I looked forward to the 1948 season with more than ordinary interest because of the record-breaking 1947. A very mild winter succeeded the glorious autumn of 1947, with Spring-like weather in January and early February, a short spell of snow and frost the last week of February, and abnormally warm Spring weather in March, April and May. The usual "Blackthorn winter" spells were shorter and less severe than usual. The result was that hibernating imagines were helped, and more than usual were seen in these months, while some Spring broods hibernating as larvae were also assisted. Of the former, *Macroglossum stellatarum* was seen flying on four separate occasions in February and again in March and April, when they may perhaps have been reinforced by immigration. *Vanessa atalanta* was flying in the sunshine on 1st February, while *Nymphalis polychloros* was seen on four separate occasions in March and April, a captured female obliging me with a fine batch of ova within an hour of asking her to do so! The usual hibernated moths were unusually abundant at Sallow bloom in March, notably *Eupsilia transversa* and *Conistra vaccinii*. The only commoner conspicuously scarcer than usual was *Nymphalis io*. Of the latter group the larval hibernators, *Lycaena (Heodes) phlaeas* and *Pararge aegeria* were in splendid abundance, showing a high survival rate from the prodigious summer and autumn broods of the previous year.

It was also to be expected that parasites might stage a more rapid recovery than insectivorous birds from the severe Spring of 1947. This prognostication was amply born out by the high proportion of Spring larvae, particularly the single brooded slowly developing species such as *Triphaena fimbriata*, which, though abundant, were found to be infested with Diptera. These pests continued in large numbers throughout the season, Autumn pupa digging being remarkably unproductive except of their cocoons, of which I have never previously seen so many, boding ill for 1949.

Few early migrants were seen; two *Colias croceus* in the Isle of Wight in April, and a few *Vanessa atalanta* and *V. cardui* only in May and June. As the Summer months progressed, cold sunless and wet

with but few warm spells, their chances of breeding profusely diminished, and the late Summer and Autumn saw few of these, or any other migrants, in this part of the country. I only saw three *C. croceus* in August and September, capturing two, one of which was a splendid ♀ var. *helice* of primrose colour.

Another dismal fact which must be recorded is one of human activity in this county; the Forestry Commission is now showing unwelcome activity in one of our best forests, the policy being to substitute beech for ash. Having cut most of the latter, this May the woodmen have stripped the entire forest of its plentiful sallows, just as the lovely larvæ of *Apatura iris*, which has been increasing steadily in recent years, were entering their last instar. Much birch grew among the ash, and this too is scheduled for destruction in five years' time when the growing beech has been sufficiently protected. I found several *A. iris* larvae on cut-down sallows and climbing hungrily up the trunks of the birch trees, and the woodmen confirmed this observation.

However, the picture is not one of unrelieved gloom, some species having done well, and even staged a good recovery. Among the latter, particularly welcome was the profusion of the Lycaenids, *Lysandra bellargus* and *Polyommatus icarus*, the second broods of both giving much delight to the eye. *L. corydon*, however, in my local colonies, continues to shrink, a process begun two or three years ago. Other species found in relative abundance included *Thecla quercus*, *Argynnis euphrosyne*, *A. selene*, *A. paphia*, but not *A. aglaia* nor *A. cydippe*, the latter continuing to be very scarce. Unusually common moths included *Eilema complana*, *Nola albula* and *N. confusalis* (locally), *Amathes ditrapezium*, *Eupsilia transversa* (in profusion), and most of the usual Geometrids. One interesting fact is the undoubted increase in the proportion of melanic to normal individuals of *Cleora rhomboidaria*, *Boarmia roboraria*, and *Boarmia punctinalis*; a brood of the latter bred ab. *ovis* from a wild pale female very surprisingly produced 75% of dark individuals, some fully ab. *humperti*. *Cleora ribeata* was abundant in a local spruce wood, and in this also a very dark form was predominant.

The dull and cold Summer months killed off the majority of the larvae of *Heodes phlaeas*, so plentiful in the Spring brood, and only occasional specimens were seen in August and September. In the latter month the weather turned warm and sunny, continuing with a few breaks right to the middle of December—the 3rd of December was recorded as the warmest December day for 100 years! The absence of Autumn butterflies during these sunny days was most marked; ivy blossom and sugar were fairly attractive, however, to the common species.

To sum up, 1948 was in Sussex a poor year; promising well in a glorious Spring, a lack of migrants, combined with a cold sunless Summer and a profusion of parasites resulted in reduced numbers of individuals in most Summer and Autumn species.

ENTOMOLOGICAL NOTES FROM EAST TYRONE 1948.

By THOMAS GREER.

(Continued from page 28.)

The blue-green form of *Procris statices* was also taken by Mr. H. C. Huggins when he was on a visit to this district in June 1938; needless to state that there is no record of the moth for Co. Tyrone in the latest edition of South's *Moths of the British Isles*, although a list of seven southern Irish counties is mentioned.

In the same meadow a colony of a large form of *Zygaena lonicerae* still exists (*Entom.*, LXXXI, page 35); this colony is remarkable in producing a number of blotched aberrations (rare in this species), the best being similar to the variety of *Z. trifolii* pictured on plate 148, figure 3, of Volume II of South's *British Moths*.

As this meadow is close to my home, the cocoons of the moth are collected every year as they appear on the rushes or grass stems and released after emergence, otherwise the greater number would be destroyed by the Reed Bunting, which tears open the cocoon and eats the enclosed pupa.

On the rocky moorland north-west of Cookstown, on June 17th, *Phalonia ciliella* was common among *Pedicularis sylvatica*, believed to be the food-plant here; and the spring brood of *Endothenia oblongana* was in fine condition flying over *Scabiosa succisa*; *Eulia pulchellana* was disturbed from the heather, and on a rocky knoll nearby *Platyptilia tesseradactyla* was observed in small numbers among *Antennaria*; this little Plume being nearly exterminated here some years ago by a heath fire; in a damp spot it was a pleasant surprise to find some numbers of the very local little moth *Adela rufimitrella* at rest on the flowers of *Cardamine pratensis*; the Bog Myrtle growing here produced several *Tortrix rusticana*.

At home larvae of *Agonopterix angelicella* were beginning to distort the leaves of *Angelica*, this little species frequent enough in this district as larva has only been found elsewhere in Ireland in the adjoining county of Fermanagh. Among *Aquilegia* several imagos of the spring brood of *Platyptilia punctidactyla* were observed in the evening.

Towards the end of the month a visit was paid to Lough Fea for *Coenonympha tullia*; there was no sign of the butterfly, but *Eucosma myrtillana* was flying in swarms over the Bilberry bushes, and *Argyro-ploce atropunctana* was fairly common among Bog Myrtle. Numbers of males of *Parasemia plantaginis* were dashing about over the heather; these are darker than the form found in the Lough Neagh area.

On the last day of June an excursion per motor cycle was undertaken to a bog near Washing Bay on the Lough Neagh shore—was almost a blank; this bog was the only station for *Andromeda Polifolia* in Co. Tyrone; this bog is now nearly all intersected by wide drains and the heather mostly burnt off; in one small area a few *Ematurga atomaria* and *Perconia strigillaria* were observed. In a marshy meadow on the way home a number of *Eustrotia uncula* were netted flying over various sedges and *Thalictrum flavum* and *Eupithecia palustraria* was taken on a roadside bank.

On 5th July *Nemophora minimella* was flying in little groups among Scabious on a dry hillside; Dr Beirne, in his list of the *Microlepidoptera of Ireland*, says frequent locally in marshes but cites only two other counties beside Tyrone.

COLLECTING NOTES.

SPRING NOTES FROM EAST TYRONE, 1949.—22nd January, *Theria rupicapra*, common at light. 30th January, *Erannis marginaria*, at rest in hedges or flying to the lamp. 16th March, *Diurnea fagella* and *Xylotropa areola*, at rest on tree trunks. 22nd March, *Selenia bilunaria*, several at light. 23rd March, *Alsophila aescularia* and *Colostygia multi-strigaria*, several at light. 1st April, *Orthosia munda*, at willows. These dates of first appearances may be of interest in comparison with those given in the *Entom. Record* for May from British localities.—THOMAS GREER, Sandholes, Co. Tyrone, 30th May 1949.

MELITAEA CINXIA.—Further to my report in last month's *Journal* of how the above butterfly was thriving in this district, I am glad to be able to say it is, this year, distributed over a much wider area and in greater profusion, notwithstanding the work on the railway embankment and a fire where the insect was first observed and which must have wiped out all early stages of the insect. With the exception of where the earthwork has been thrown up the butterfly was again flying over the burnt parts now much richer in vegetation and the food-plant of the insect.

At the time of writing, 28th May, the flight of the butterfly is over. A week or so before this date I captured a fair number of both sexes and put them out on a suitable site further afield also on my own property where there is plenty of the food-plant, having an acre or two wild and uncultivated. A few females placed in a breeding cage have given a few batches of eggs. If and when these hatch and the larvae have reached a decent size they will be put down on private property in likely places where they may thrive.

I found a number of the specimens from this locality are of a minor aberration in that on the underside of the forewing the black narrow apical transverse waved line which in normal specimens is confined to the upper half of the wing, is extended to the anal angle, getting broader all the way to that point.

I have found out that specimens were brought from the Isle of Wight in 1945 or 1946 and put down near New Milton, which no doubt have spread to my locality on their own account. Thus the species is now well established over a fairly wide area and as the area is well fenced there is no inroad of cattle to do damage. It is only to be hoped fires do no extensive harm.—CHAS. B. ANTRAM, "Clay Copse," Sway, Lymington, Hants, 28th May 1949.

CURRENT NOTES.

I HAVE just read in your last issue, April 1949, page 43, a note about the French *Revue Francaise de Lepidopterologie*, and feel I must let you know the facts of this journal and the *Catalogue of the Micro-Lepidoptera*. First about the *Revue*: it was almost quite interrupted during the war but Vol. IX, 1938-1939, is out, and the Vols. X and XI are out—that takes us to 1949, of which the first two numbers of Vol. XII are published; it is keeping its head above water and is, as it was before, excellent. For the *Catalogue of the Micros*: since '45, 180 pages have been published, which takes it to Cosmopterygidae, number 3173rd species of Lepidoptera, which is *Stigmatophora dohrni* Zeller. Anyone wanting to subscribe to the *Revue* and or for the *Catalogue* should write direct to Monsieur Lhomme, Le Carriol, par Douelle, Lot. I believe he can still supply the back numbers of Vol. IX and those of Vols. X and XI, which are full of interest; also for those people who want their sets complete I do know the Vols. IX and X were printed in fewer numbers owing to the paper shortage. As for the Micro Catalogue I know M. Lhomme is paying quite a good bit out of his pocket and it would be of real service to him for all who take an interest to subscribe, apart from the fact that it's a service to science as a whole. These subscriptions to scientific journals abroad are allowed to go out of the country (the money); one has only to ask the permission of the Bank of England, saying it is necessary for one's scientific work. I feel I should point out to you that M. Lhomme's name is written Lh., not L'homme. I feel certain that my above information may be of interest to a certain amount of lepidopterists, and have, therefore, ventured to write and let you know.—VERA M. MUSPRATT, Aicé Choko, St Jean-de-Luz, Basses Pyrénées, France, 1st May 1949.

P.S.—Since this letter was received we regret to report that Lhomme met with an accident, and has since died.—HY. J. T.

ANKARA VILAYETİ DAHİLİNDE MEVCUT ÇEKİRGELEİN EKOLOJİK COĞRAFI VE SİSTEMATİK DURUMLARI ÜZERİNDE ARASTIRMALAR, by Dr TEVFIK KARABAGH.

This somewhat formidable title conceals what is a full and clear account of the Orthoptera of the *vilayet* or county of Ankara by a keen young Turkish orthopterist, Dr Tefvik Karabagh. Although it remains a closed book to all but a handful of non-Turks, the names of species and localities and an abstract in German will enable European workers to form a clear enough idea of the orthopterous fauna of this typical district of the north-central portion of the Anatolian steppe plateau.

The four *Blattidae* mentioned are all introduced species, so it is to be expected that native forms may yet be found, probably of the genus *Hololampra*, nor have any *Phasmidae* been noted. Of the *Mantidae*, four familiar forms. Of the *Tettigoniidae* 26, of the *Gryllidae* 7, and of the *Acrididae* 71, making a total of 111 species of Orthoptera. Perhaps further collecting will reveal a dozen or more to add to the list.

Among the new and restricted species there are *Isophya karabagi*, Uv., and *I. nervosa*, Rammei, the new *Micrimon karabagi*, Ramme, *Poecilimon uvarovi*, Ramme, *Saga cappadocica*, Wern., *Rhacocleis turcicus*, Uv., *Drymadusa angorensis*, Uv., *Paradrymadusa rammei*, Uv., *Scodrymadusa turcica*, Ram., *Süreyella bella*, Uv., all Tettigonids; *Eremippus angulatus*, Uv., and *E. gracilis*, Uv., at least three subspecies of *Tmethis heldreichi*, Br. v. W., *Pezotettix anatolicus* Uv., *Paranocarodes tolunayi*, Ram., and *Nocarodes bodenheimeri*, Uv.

Determination tables are given, with plenty of outline drawings to make them clear, and a considerable amount of ecology, which is desirable and practical, as several are of economic importance.

A QUERY: BRITISH NOCTUAE.—In *Brit. Noctuae and their Varieties* Tutt, when dealing with *Toxocampa craccae*, Vol. IV, p. 43, quoted the typical description (in Latin) published by Fabricius in the *Mantissa*, p. 121. As Fabricius issued 6 *Mantissas* in some 20 years, it is important to know the particular *Mantissa* quoted, and certainly the date of its issue.—HY. J. T.

REVIEWS.

PROCEEDINGS AND TRANSACTIONS OF THE SOUTH LONDON ENTOMOLOGICAL AND NAT. HIST. SOCIETY, 1947-48. xviii + 241 pp., 13 plates, 58 text figs. 1949; 30/-.

This fine volume contains a Report of the Meetings between 12.ii.47 and 28.i.48. The Address of the President (L. T. Ford) included (pp. 49-58) a List of the Microlepidoptera recorded from this country since the issue of Meyrick's *Revised Handbook* in March 1928. Two plates show aberrations of Lepidoptera included in the Annual Exhibition on 25.x.1947.

"Technique of Breeding Lepidoptera," by A. V. Hedges (pp. 74-81), includes remarks on what the author is inclined to consider possible good species. E. A. J. Duffey contributes (pp. 82-98) an illustrated account of *Aromia moschata*.

A Paper on the Function, Origin and Classification of Pupae, by Dr H. E. Hinton (pp. 111-154, 39 figs.), is full of interest but seems rather "strong meat" for a publication of a Society of amateurs. We note that three previous papers on the same subject by the same author have been issued in as many different publications: to the Museum worker, who has all these publications accessible, this action presents less difficulty than to the private student who has not the same facilities. This paper, we suggest, would have been better published in the *Trans. R. Entom. Soc.*

Dr Cockayne's paper on "*Arctia caja*: its variation and genetics" (pp. 155-191), is illustrated by two excellent coloured plates, and includes descriptions of several new forms.

"*Adela viridella*" is the subject of a short note by D. D. Murray (pp. 192-193, tab.) and H. Main gives us (pp. 194-195, 2 tabs.) another on Trap-door Spiders in Portugal, whilst (pp. 205-208) S. Wakely re-

cords from Herne Hill, S.W. London, a species of *Blastobasis* resembling *decolorella*, Woll.

S. N. A. Jacobs has a paper (pp. 209-219), with a fine coloured plate, on "The British Lamproniidae and Adelidae," with brief notes on all our species of Incurvariidae and Adelidae. Of more local interest are "Some Notes on the Coleoptera of Epping Forest," by F. D. Buck (pp. 220-227).

T. BAINBRIGGE FLETCHER.

A GUIDE TO THE SMALLER BRITISH LEPIDOPTERA, by L. T. Ford. 1949; 15/-.

This book is not quite what might be expected from its title, being really on the lines of Scorer's "Logbook"; the species, however, are in systematic order and are numbered, an alphabetical index being provided and also a list of foodplants. The entries are given under the headings of Ovum (mostly left blank), Larva, Pupa and Imago, but are necessarily very brief. The arrangement follows generally that of Meyrick's *Revised Handbook* (1928), but takes no account of Meyrick's later actions: e.g., *Argyresthia* was referred by him to Plutellidae in *An. Mus. Hist. Nat. Buen. Aires*, XXXVI, 378 (1931), and *Ocnerostoma* was also referred by him to the Plutellidae in *Exot. Micr.*, IV, 339 (xii.1932). Mr Ford also uses most of Meyrick's names and, in the case of the European species, Meyrick blindly copied Rebel's Catalogue, to the perpetuation of such errors as *Tischeria* "*angusticolella*," which Duponchel named "*angusticollella*," "*l'Elachiste à col étroit*," with reference to its narrow neck.

Are *Platyptilia punctidactyla*, Hw., and *P. acanthodactyla*, Hb., really double-brooded, as alleged? I have found both species here during the last twelve years or so, but larvae only in August and moths from September onward into hibernation, but have failed to discover larvae in June.

The eggs of *Pselnophorus brachydactylus*, Kollar, are laid at the end of June or in early July in groups under the leaves, scattered, but often twenty or more on one leaf, glistening and quite conspicuous when the leaf is turned over. On hatching, the young larvae feed on the lower epidermis, causing noticeable blotches, until about mid-August, when, irrespective of temperature, they begin to hibernate under dead leaves. They recommence feeding in April and are full-grown by the middle or end of May and at that stage may often be detected by their habit of biting the midrib of the leaf so that it droops. Pupation almost invariably takes place off the foodplant, but near it, and the moth emerges in June or early July. It is of very local occurrence, and is best taken in the daytime by blind sweeping around portions of the foodplant, as the moth is almost invisible on the wing in the mingled sunlight and shade of its habitat. But eggs and larvae are easily found where they occur and are easily reared on *Lactuca muralis* grown in pots or boxes of earth. Such is a brief résumé of the life-history, but even such a summary is too long for the *Guide*.

No. 206. *Stenoptilia graphodactyla*, Tr., should read *pneumonantus*, Büttner. We do not get *graphodactyla* in England.

No. 262. "*Euxanthus*" should read "*Euxanthis*."

Nos. 598 and 604 are one species.

Nos. 628-639 are better placed in *Bryotropha* (with single bristle on antennal scape) and Nos. 640-659 in *Gelechia* (without bristle on antennal scape).

No. 1077, *Littocolletis emberizarpennella*, Bouché, and No. 1138, *Ypsolophus xylostellus*, Linn., occur also on Snowberry (*Symphoricarpos*).

Most collectors of Micros. could make such remarks and addenda. All will find this *Guide* useful and, it is hoped, will be able to fill in many blanks.

T. BAINBRIGGE FLETCHER.

NOTES ON THE HABITS AND PREY OF TWENTY SPECIES OF BRITISH HUNTING WASPS, by W. S. Bristowe. (*Proc. Linnean Soc. Lond.*, CLX, 12-37; 26.xi.1948.)

A very interesting series of Notes, illustrated by six text-figures.

T. BAINBRIGGE FLETCHER.

BRITISH BUTTERFLIES, by Vere Temple. Collins, 1949; 5/-. Pp. 48 + 8 col. plates + 22 figs.

This book seems intended to appear chiefly to those with some liking for a knowledge of Butterflies and such readers will find as much as they are ready to absorb and even the regular lepidopterist will come across some items of interest. No detailed account of species can be expected in less than 48 pages of letterpress. The illustrations are a mixed lot, including reproductions of figures from Moufet (here called "Moffett"), Wilkes, Moses Harris, Donovan and more modern authors. The plates and figures are not numbered. The first coloured plate is the most interesting, being a reproduction from the original MS. of Moufet's *Theatrum Insectorum*, showing figures of *Papilio machaon* and *P. podalirius*: these original water-colours (prepared by Gesner?) are much more life-like than the crude wood blocks (prepared from de Mayerne?) and published in the *Theatrum*: also the coloured figure of *P. machaon* is 66 mm. in expanse, as against 91 mm. for the wood block, and similarly for *P. podalirius*. The figure on p. 8 of the book under review is evidently the original of the fourth woodcut on p. 102 of Moufet's book; Werneburg does not identify it and suggests *Pararge aegeria*, which seems unlikely; perhaps it is an exotic.

T. BAINBRIGGE FLETCHER.

EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge.

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Wanted.—I need specimens of *Lycaena* (*Heodes*) *phlaeas* from all parts of the world, particularly Scandinavia, Russia, Siberia, Madeira, Canaries, N. Africa, Middle East counties, and E. Africa; also varieties from British Isles or elsewhere. I will purchase these, or offer in exchange good vars. of British Lepidoptera or many sorts of foreign and exotic Lepidoptera.—P. Stutter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.

Wanted.—For the British Museum larval collection, larvae of Chrysomelid beetles, alive or preserved. Liberal exchange if required.—Dr S. Maulik, British Museum (Natural History), Cromwell Road, London, S.W.7.

Wanted to Purchase.—Pupae in any quantity of any species of moths.—R. M. Rickard, Coningsby, Lincoln.

Wanted to Purchase.—African Section of Seitz' *Macrolepidoptera of the World*, both Butterfly and Moth Volumes, either bound or in parts.—D. G. Sevastopulo, c/o Ralli Brothers Ltd., P.O. Box 401, Kampala, Uganda.

Wanted.—Distribution Records, Notes on Abundance and Information regarding Local Lists of the Dipterous Families Empididae and Conopidae.—Kenneth G. V. Smith, "Antiope," 38 Barrow Street, Much Wenlock, Salop.

Wanted to Purchase.—Leech's British Pyrales. Coloured Plate Edition.—A. W. Richards, Nether Edge, Hawley, near Camberley.

Wanted.—Set or in papers, Scotch and Northern England forms of the British butterflies; specially *Coen. typhon*, *Erebia epiphron*, *Lycaena artaxerxes*, and *Lycaena salmacis*. Purchase or in exchange for Southern forms of many species.—Chas. B. Antram, F.R.E.S., Clay Copse, Sway, Lymington, Hants.

Wanted.—Specimens of *Velta currens* Fabr. (Hemiptera), in any condition, from all parts of the British Isles or Western Europe, especially from the more remote parts of the west and north, for taxonomic study.—E. S. Brown, Hailey Lodge, Hertford Heath, Hertford.

Wanted.—Notes of fluctuations in numbers of *Rhingia campestris*, Mg. (Dipt., Syrphidae) in 1947 and 1948. Also notes of numbers in 1949.—B. R. Laurence, 31 Sherwood Road, Luton, Beds.

Now Available.—Reprints of "British Dipterological Literature, Suppt. IV.": price 1/-.—Apply to H. W. Andrews, The Rookery, Breamore, Fordingbridge, Hants.

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Royal Entomological Society of London, 41 Queen's Gate, S.W.7: July 6th, September 7th, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; June 29th, July 13th, 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*. Monthly Meetings are held at Museum and Art Gallery. Particulars from Hon. Secretary, H. E. Hammond, F.R.E.S., 16 Elton Grove, Acocks Green, Birmingham.

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SOME NEW RECORDS OF LEPIDOPTERA FROM CYPRUS, IRAQ AND IRAN.

AUG 17 1949 By E. P. WILTSHIRE, F.R.E.S.

During the past three years I have studied principally Arabian and Egyptian Lepidoptera, publishing the results in *Bull. Soc. Fouad le Prem. d'Ent.* [Cairo], 1947-1949. However, problems arising from other Middle East countries were not entirely left aside, and I can now report a few additions to the lepidopterous fauna of Cyprus, Iraq and Persia [Iran], mostly from my own collections, in continuation of my last articles or works on these countries.* This seems a suitable place to include any corrigenda, whether to my own lists or others, found to be necessary.

I. CYPRUS.

SATYRIDAE.

Eumenis pellucida Fruhst. *cypriensis* Holik.

The correct name of the Cyprian species hitherto called "*Satyrus semele mersina* Stgr." is as above, and *semele* is therefore to be deleted. Full details of the revision of the *semele* group by Holik have not yet appeared, as far as I know, but the facts are now known to various workers.

AGROTIDAE.

Amephana dalmatica Rebel.

According to Boursin, this is the correct name for No. 7 in my article on Cyprus, not *aurita* J. Specimens in the British Museum from both West and East Mediterranean localities are still lumped together all under the latter name.

Leucania punctosa Tr.

According to Boursin, the East Mediterranean species in this group is as above, not *putrescens*. It is *punctosa*, I understand, which occurs in Syria and Persia, and the name *putrescens* therefore is probably to be deleted in the lists of lepidoptera from Lebanon, Egypt, Iraq and Iran, and *punctosa* substituted.

ARCTIIDAE, NOLINAE.

Nola impura Mann.

Two, 16.iv and 18.v, one mile west of Kyrenia.

Celama subchlamydula Stgr. *derasa* Zerny.

One, 6.iv, one mile west of Kyrenia.

Celama centonalis Hübn. [= *aerugula* Hübn.].

Two, 5.iv and 16.v, one mile west of Kyrenia.

GEOMETRIDAE.

Sterrhia dimidiata subsaturata Guen.

Four, iv, in a quarry overgrown with *Juncus* and *Inula viscosa*, Kyrenia.

*Cyprus: Middle East Lepidoptera. IX: Two new forms or species and thirty-five new records from Cyprus. *Ent. Rec.*, LX [15.7.48]. Iraq: The Butterflies and Moths of Iraq. Directorate-General of Agriculture, Bagdad. *Bulletin* 30 [Oct. 1944]. Persia: New Records of Lepidoptera from Iran, II. *Ent. Rec.*, LVIII [15.6.46].

Selidosema tamsi Rebel.

Mr D. S. Fletcher's examination of the genitalia of European and Mediterranean *Selidosema* has had a surprising result. There are not two Cyprian species, in this genus, as Rebel thought, but only one, the new species Rebel described. It is very variable and some examples closely resemble *ericetaria syriacaria* Stgr. which however does not appear to inhabit Cyprus and must be deleted. It follows that the biological notes given in my article on Cyprus [larvae on *Poterium*] refer to *tamsi*, not *ericetaria*. Fuller details of the larva and a photograph will be published in a later article.

II. IRAQ.

HESPERIDAE.

Spialia proto Esp.

Not having previously examined the genitalia of the species of skipper of which I took three examples on 25.viii.35 at 7-9000 ft. near Rayat, Iraqi Kurdistan, I referred to this species in my article in *Ent. Rec.*, 15.10.39, as "sp. near *proto*." For the same reason, in my 1944 list, I stated that the occurrence of *proto* at great heights required confirmation, though mentioning the occurrence of the species in Iraq at lower elevations. I have quite recently examined the genitalia of one of the three specimens [Prep. 413] and can now confirm the identity as certainly *proto* Esp.

AGROTIDAE.

Cardepija albipicta Christ.

9.v and 26.xi.43, Maagil near Basra [oasis], [pale ochreous form].
14.iii.37, Seleucia, near Bagdad, [olive-grey form].

This widely distributed Pan-Eremic species inhabits deserts and oases. The North African form was named *afra* by Bethune-Baker.

The species at Ahwaz [South-west Iran], whose larva I described with an illustration in *Ent. Rec.*, LII, p. 72 [1940] under the name *Discestra arenaria* Hamps, is in fact this same species which can therefore be added also to the Persian list. Perhaps the undetermined "*Scotogramma*" Brandt mentioned from the extreme south of Persia is the same.

I have not examined the genitalia of the type of *arenaria* Hamps. from Karachi but have compared it carefully and now consider it specifically different. The hindwing termen is distinct, whereas it is not so in *albipicta*, in which the submarginal shade is the clearest hindwing marking. The orbicular stigma on the forewing of the *arenaria* type is concolorous whereas in *albipicta* it is often whiter: this difference is perhaps less important owing to variability.

Therefore on p. 72 of Vol. LII readers of the *Ent. Rec.* should correct *D. arenaria* to *C. albipicta* Chr. Species No. 219 in my Iraqi list should be similarly corrected.

Trichoclea avempacei Tams [= *Calophasia pampaninii* Kruger Syn. Nov.].

30.iii.37, Kerbela desert.

Leucania punctosa Tr.

See remarks under Cyprus, above.

Plecoptera reflexa Guen.

28 and 31.iii.43, Basra, [oasis]. A Tropical Indian species.

ARCTIIDAE, NOLINAE.

Celama turanica Stgr.

Bagdad and Basra, various dates, oasis.

GEOMETRIDAE.

Sterrhia illustris Brandt.

19.ix.43, Basra, [oasis]. Previously known from South Persia.

Nychiodes variabilis Brandt.

On comparing my topotypical *variabilis*, from Fars, with my Iraqi series of *Nychiodes* from Kurdistan, I was unable to detect any superficial difference. The Iraqi species was determined by Prout for me as *divergaria* before he saw Brandt's description of *variabilis*. It is unlike the plate of *divergaria* given in Seitz *IV Suppt.* I presume therefore that these records of *divergaria* from Iraq, whether from Kurdistan or Bagdad, should be amended to *variabilis*, which, I notice, has recently been reported from East Turkey by De Lattin. That true *divergaria* may also inhabit Northern Iraq is, however, still possible.

Dyscia osmanica Wagner.

23.v.37, Amadia. Prep. 401. Species No. 432 (*conspersaria*) in my Iraqi list should be amended accordingly, this new determination being by genitalia. Wagner's name was until recently considered merely a variety of *conspersaria*.

PYRAES AND MICROS.

A full account of these is at last ready and will appear in *Bull. Soc. Fouad le Prem. d'Ent.* [Cairo] this year, the author, to whom I am indebted, being Dr H. G. Amsel. The material was sent to him in 1938. His work will contain over a hundred figures, including the genitalia of Meyrick and Amsel types, and is translated into English.

III. PERSIA [IRAN].

HESPERIIDAE.

Eogenes lesliei Evans subsp. *elama* Wilts.

In my full description of the race *elama* from the desert foot-hills of South-west Persia (*Ent. Rec.*, 58, 15.iii.46, p. 27) I quoted Brig. Evans' opinion, given in 1938. Since then, however, he has changed it, and now considers *elama*, together with his *lesliei* (from Afghanistan), as specifically distinct from *alcides* H.S.

LASIOCAMPIDAE.

Lasiocampa piontkovskii Shelj. 1943.

The species recorded under the name *grandis* Rog. in my Iraq list (sp. no. 143) is probably, and in my first Persian list (*Ent. Rec.*, 57, 15.vii.45, p. 80, sp. no. 8) is certainly, the same as that described during the war under the above name from Transcaucasia (Araxes). Readers of those lists should correct *grandis* to *piontkovskii*.

AGROTIDAE.

Cardepiä albipicta Chr. and *Leucania punctosa* Tr.

See remarks under Cyprus and Iraq above.

Metaegle pallida Stgr.

12.vi.41, Shiraz, 5500 ft., stream-valley among dry hills.

15.vi.41, Muk Pass, Fars, 6500 ft., scrub-wooded limestone mountains.

This species here flies together with *Aegle mimetes* Brandt, which superficially resembles it; a case of convergence.

GEOMETRIDAE.

Crocallis tusciaria transcaucasica Wehrli.

Adults hatched 6, 7 and 8.xi.41, from larvae found in iii.41 at 3000 ft. at Shapur Gorge, Fars, near Kazeroon. The foodplant observed there was wild-*Prunus*, and at a higher elevation [8000 ft., Kuh Surkh, near Shiraz] mountain-*Fraxinus*.

The two following names of new species being described this year [1949] in *Bull. Soc. Fouad le Prem. d'Ent.* are also to be added under Geometridae to the Persian list:—*Rhodostrophia debilis* Wilts., *Scodionista astragali* Wilts., both inhabiting the scrub-clad mountains of Fars.

In my previous articles on Iran I have tried to give all the recent publications on Iranian lepidoptera known to me. Continuing this policy, I can mention the two following works. They are the first of their kind to have been printed in Iran:—

Afshar, Dj. Sept. 1946 ff. *Liste des Rhopalocères de l'Iran*.

Kiriukhin, G. Sept. 1946. *Les insectes nuisibles au Pistacier en Iran*.

Both appeared in *Ministry of Agric. Quarterly Pub.*, Nos. 1 ff., Tehran.

LITERARY REFERENCES.

References are listed in my three works mentioned in the footnote above.

NOCTUAE OF PULBOROUGH, SUSSEX, IN 1948.

By A. J. WIGHTMAN, F.R.E.S.

A strip of marshland lying alongside a public highway at Pulborough, having been scheduled for filling and levelling for road straightening purposes, I decided in late June 1948 to work it intensively with a view to finding out what species of Noctuae occurred there and also to remove if possible any interesting species I might find to similar and unthreatened terrain, of which there is no lack locally.

I did not expect to find insects very numerous, as this land is under floodwater most years, for weeks on end, and often this water is several feet deep.

This marshy strip was about 3 acres in extent, very wet, even in summer. The chief vegetation was *Glyceria aquatica* with fair quantities of *Phalaris arundinacea*, *Juncus effusus* and *Iamprocarpus*, a small area of *Phragmites communis*, much *Iris pseudocorus*, with endless marsh plants such as *Thalictrum flavum*, *Spiraea ulmaria*, and *Angelica sylvestris*, making a dense mass of vegetation.

During July and August 60 species of Noctuae were taken, including *L. albipuncta* and *straminea*, *C. rufa*, *A. ophiogramma*, *C. leucostigma*, and *H. suasa*; it is with these two last that these notes are really concerned.

C. leucostigma was abundant, its peak period being early August; in all, 120 insects were taken, and the bulk kept for ova, of which many thousands were put down among *Iris* this Spring, just when they were hatching, close to Pulborough.

The most plentiful form was dark, almost black-brown, the only discernible marking being the conspicuous reniform stigma, usually ochreous-yellow, typical *leucostigma*, Hb., but quite commonly pure white, ab. *albipuncta*, Tutt. Nearly as common was the dark-brown ground colour form with a pale streak between the outer line and the submarginal line, usually called *fibrosa*, Hb., although brown, not red, in colour.

In fact, this name applies not so much to an individual form as to a group of forms since it occurs in several different ground colours and the streak itself varies in different individuals from definite pale brown to almost pure white.

Between these two main forms a much less plentiful form occurred in which a red-brown ground colour (*micacea* colour) was clearly marked in darker brown but had no sign of the pale streak. This can hardly be *lunina*, Haw.

This species came freely to sugared rush bloom and reed flowers and was also to be taken sitting about on the reeds, but I found it very much awake.

HADENA SUASA.

Why this species and its near allies, *v-latinum* (*genistae*), *contigua* and *thalassina*, are now placed in the old genus *Dianthoecia* (now *Hadena*) I have no idea.

I should have thought the form of the pupae alone would have separated them, without the evidence of the genitalia, which, according to Pierce (♀ *Genitalia of the Noctuidae*, page 47) would place *oleracea* (now in *Diataraxia*) in the same genus with *v-latinum* and keep the old genus *Dianthoecia* separate with *A. irregularis* added to it.

Such an arrangement may do violence to some modern conception of generic or specific relationship, but it would be more natural than the present classification.

The species *oleracea* and *suasa* have almost identical life-histories, pupal form, larval form, and the imagines behave in the same way.

The species *irregularis* feeds on the characteristic pabulum of the *Dianthoecia*, i.e., *Silene otites*, behaves as a larva like a *Dianthoecia*, has the characteristic *Dianthoecia* pupal form, behaves as an imago like a *Dianthoecia*, and lastly has a genitalic form agreeing with the *Dianthoecias* (*Hadenas*) according to Pierce (♀ *Genitalia of the Noctuidae*, page 49).

In my strip *suasa* was not a very plentiful species, but occurred in small numbers in Hants. over a period of seven weeks.

The variation was very great and hardly any two of the insects taken were alike. During the period of its occurrence I selected a number

of extreme ♀s for breeding, one of which was definitely black, with snow-white submarginal line, another deep red-brown so deep as to appear black in any light but daylight, and yet another was leaden-grey with heavy fuscous suffusion, largely obscuring the markings.

I must mention here that I already had a brood of *suasa* larvae feeding from a Hants. ♀ given me by Mr A. H. Sperring in June. This ♀ was very dark in colour and was selected for that reason.

These Hants. larvae were already well on the way to full grown before the first of the Pulborough batches had hatched and indeed they (the Hants. brood) had pupated by early August.

I expected that they would emerge as a second brood, but in this I was mistaken, only 21 emerging in September.

All these Hants. forms were pale ochreous-brown in ground colour, heavily marked in hepatic brown and agree well with Barrett's fig. 1, plate 157, which form Rebel has named ab. *variegata*. None were dark like the parent ♀.

None of my Pulborough *suasa* emerged in the Autumn, but to my surprise they emerged in early May, a good month ahead of the remaining Hants. *suasa*, which had been so much longer in the pupal stage and had given a partial autumnal emergence.

None of these Pulborough insects is of the *variegata* form, none in fact are brown-marked, but a good number are unicolorous black-brown with only marking a white submarginal line and a small suffused orange-yellow spot, representing the upper outer edge of reniform.

Except that my fresh insects are $1\frac{3}{4}$ in. in expanse and too deep blackish-brown in colour to show markings, they are represented by Barrett's fig. 1b, plate 157, which may not be from a fresh example.

Rather less plentiful is another unicolorous form except for the white submarginal line and an orange spot, as mentioned above, the ground colour of which is blackish-red or black with red tone, far deeper in colour and without the marking detail of Barrett's fig. 1c, plate 157.

A third form which also was far from scarce in these Pulborough insects has the ground colour purplish-grey and even in tone all over the wing, but all the markings can be discerned in blackish-grey. I can find no figure of this lovely form which in its palest manifestation is almost wine-dregs colour, but no doubt it is of widespread distribution.

Outside these three main forms, there are a number of individual forms, some of which are very beautiful. One such has a red-brown ground colour with the usual marking indicated in paler red-brown colour with white submarginal and a few whitish lines in discal area. Had I taken this insect wild I should have placed it to *thalassina*.

The Spring emergence forms of the Hants. *suasa* does not differ from those of the Autumn emergence, but while these insects are all ab. *variegata* they do vary a good deal, and in some ground colour is a definite yellow shade, in others almost blue-grey. But all are marked in hepatic brown and show great contrast between ground colour and markings.

I fed these *suasa* throughout on Knotgrass and despite the large number reared (600 odd) had no trouble.

I released over 400 of the Pulborough strain in a nearby marsh.

OBITUARY.

SIR JOHN FRYER, K.B.E., F.R.S., 1886-1948.

John Claud Fortescue Fryer died suddenly after an attack of pneumonia on 22nd November 1948. He was born on 13th August 1886 at Chatteris, where he spent much of his early life acquiring an interest in farming and an intimate knowledge of the fens. He was educated at Rugby and Gonville and Caius College, Cambridge, where he took a First Class in the Natural Sciences Tripos, and soon after was appointed a Fellow.

As Balfour Student he went to Ceylon and carried out his classic work on the genetics of *Papilio polytes*, L., proving that the *cyrus* form of female, which resembles the male, is recessive and the *polytes* form, which mimics *P. aristolochiae*, is determined by a dominant autosomal gene, and the *romulus* form, which mimics *P. hector*, is determined by an additional dominant modifying gene.

Later he took part in the Percy Sladen Trust expedition to Aldabra Island and wrote papers on the fauna and physiography. On his return he was appointed Entomologist to the Ministry of Agriculture and in 1920 Director of the Laboratory of Plant Pathology at Harpenden, and when the Agricultural Research Council was established he became its first secretary.

Throughout his life he was interested in the British Lepidoptera and took most of the local species found in Norfolk, Suffolk, and Cambridgeshire, including *Apatele strigosa*, Schiff., *Coenotephria sagittata*, L., and *Nonagria neurica*, Hb. His interest, however, was not confined to the Lepidoptera and he had a wide and accurate knowledge of other orders. For many years in association with H. M. Edelsten he looked after Wood Walton Fen on behalf of the Society for the Promotion of Nature Reserves, and together they succeeded in finding the larva of *Hydrillula palustris*, Hb., bred the moths, and obtained fertile eggs. They published a fascinating paper on its life history, showing that its favourite food is meadow-sweet, and that after hibernation it eats the dead leaves of this plant before pupating.

In his later years most of his published work was concerned with economic entomology, but his study of *Acalla comariana*, Zell., led to the publication of an important paper on its genetics showing that the colour of the button and the ground colour are inherited independently.

Tall, thin, and distinguished in appearance, he had great personal charm and collecting with him for a week-end was a most enjoyable experience. I remember particularly well the one when we went to Cricksea for *Leucania favigolor*, Mathew, and both succeeded in breeding it from the egg. Later I spent a week-end with him to count its chromosomes, and we were both disappointed to find them 31, the same number as *L. pallens*, L. He had thought that, being more robust, *favigolor* might have a larger complement.

Fryer's great ability was recognized by his election as President of the Association of Applied Biologists in 1926, and of the Royal Entomological Society of London in 1938. He was created K.B.E. in 1946, and elected a Fellow of the Royal Society in 1948. He married a daughter of Mr T. H. Denny-Cooke in 1919 and there were two children of the marriage, a son and a daughter.—E. A. C.

LEONARD WOODS NEWMAN.

L. W. Newman was born on June 7, 1873, at Singleton in Sussex, and died on March 11, 1949. Like most good entomologists he was a keen collector in his boyhood and after he had taken a position in a tobacco firm his talent attracted the notice of the late Robert Adkin, who encouraged him to make entomology his profession. In 1894 at Bexley he started the business, which prospered and eventually became known all over the British Isles and the Continent. Unlike most dealers he confined himself to British Macrolepidoptera and was most careful never to sell any insect of doubtful origin. His honesty and integrity were well repaid by the complete trust reposed in him by all his clients. Another cause of his success was his unremitting care in breeding and inbreeding very large numbers of many species coupled with an almost instinctive use of the right treatment for the more difficult species.

He was a good field naturalist and loved collecting larvae and imagines near his own home and on his holidays at Royston and Folkestone. He bred many wonderful aberrations singly or in some numbers, but in some cases he carried on a strain for many generations. For years he bred the yellow form of *Callimorpha dominula*, ab. *lutea*, and later ab. *bimacula* from a colony in Tubney Wood. He bred dozens of the melanic form of *Ennomos autumnaria*, ab. *schultzei*, a strain derived from a dozen eggs laid by a normal female taken at Dover and sent unsolicited by a schoolboy in the hope of an exchange. Newman, with his usual kindness of heart, kept the eggs and sent the boy what he wanted, and was richly rewarded. Year after year he bred magnificent forms of *Mimas tiliae*, one spotted, obsolete, red-brown, and very pale, and his strain of *Laotoë populi* besides producing beautiful pink and buff forms gave about one per cent. of gynandromorphs.

The recessive aberration of *Saturnia pavonia*, in which yellow replaces pink or purple, was bred for the first time in England by Newman from a female taken at Grays, but only in one generation, owing to infertility. A considerable number of *Lasiocampa quercus* ab. *olivaceofasciata* and ab. *olivacea*, formerly considered great rarities, were bred in successive years from cocoons sent from Caithness.

He was less successful with *Abraxas grossulariata*, though he bred many *varleyata* and by selection obtained a fine strain of the white rayed *actinota*, and by selecting the darkest ab. *aberdoniensis* he bred some with entirely black forewings. He bred many hybrids, including *Selenias* and *Cosymbias*, but his greatest triumph was hybridizing *Notodonta ziczac* and *N. dromedarius*, hybr. *newmani* Tutt, which had never been accomplished before and has not yet been repeated. Perhaps his most spectacular success was the breeding of several black *Papilio machaon*, and he was unlucky not to breed more, but was defeated by their weakness and infertility.

At Stevens's Auction Rooms he was a well-known figure. He catalogued most of the big collections and was the chief buyer, either on commission or for himself.

Busy as he was he found time to write in joint authorship with H. A. Leeds that useful and practical work "A Textbook of British Butterflies and Moths."

In his later years he lived at Woodvale, and those privileged to go there to inspect collections will not readily forget the hospitality of Mrs Newman, who did so much to help him to build up his business. After a stroke in 1942 he retired, but his house was damaged by a bomb in 1944, and it was some time before he was able to return and spend his last years in peace. I think the best tribute I can pay him is to say that he won the respect and affection of all who dealt with him and that his clients were his friends.

UNUSUAL FOODPLANTS OF *GORTYNA FLAVAGO*, SCHIFF.—On June 20, in a derelict garden near Dover Castle, I noticed a wilted shoot of *Buddleia variabilis*, on a bush which had been cut down and grown again sending out a number of vigorous green shoots about three or four feet long. The terminal six inches were bent over and flabby, but still green and there was a small dark spot just below the bend. Slitting it open I exposed a boring running up almost to the tip and in it a young larva of *Gortyna flavago*, Schiff. A brief examination of the bush showed another shoot in the same condition and inside just above the dark spot was another larva of the same age. A plant of mugwort, *Artemisia vulgaris*, growing near had one stem with a wilted extremity and a dark spot at the side situated just below the wilted portion, and in the boring which ran up towards the tip was a young larva of the same species. I think both these food-plants are sufficiently unusual to be worth recording.—E. A. COCKAYNE.

COLLECTING NOTES.

SECOND BROOD OF *PLUSIA FESTUCAE*.—In June 1948 I netted a few *P. festucae* at Iris flowers in Pulborough Marsh, the moths appearing just before dusk. I kept 2 ♀s for ova, which were readily forthcoming; they hatched in about a fortnight.

At first I fed the newly-hatched larvae on Iris leaves in glass-topped boxes and this food seemed to suit them, as they eroded the leaves for the flat surface, leaving the leaf skeleton. I tried Iris flowers, and found they were attractive to the larvae, but a bad food, quickly shrivelling and becoming very sticky, trapping and killing the tiny larvae.

A peculiarity of these larvae was that they at intervals bent the head round to anal orifice and seized the newly-evacuated frass, after which the head was jerked vigorously from side to side and the pellet thrown clear; often this jerky side-to-side movement was continued after pellet was disposed of.

After a month's feeding these larvae were still so small that a second brood emergence seemed out of the question. I tried various other plants as food to see if a change of food would speed up growth. *Phragmites*, *Phalaris*, *Carex* and *Glyceria* were tried, and I found *Glyceria aquatica* was specially fancied and on the plant the larvae began at last to grow quickly.

I now removed them from the tins and placed them in a roomy breeding cage with glass top and part zinc sides, in which the reed-like

leaves of *Glyceria* were placed in a bowl of water and fresh stems added daily and old leaves removed.

These larvae never showed any inclination to leave the foodplant, feeding high up in the leaves in full daylight and sunlight, often two or three close together, and by August 15th they were full fed and some were spinning their cocoons on the underside of foodplant leaves. Of 51 larvae not one left the food to spin up on side of cage, or tried to winter. The pupae were at first black, but before emergence had pink areas on wing cases.

Emergence began on September 4th, and the moths are very high coloured and larger than wild taken specimens. Those I bred are very uniform, but from pupae I had given him Mr A. H. Sperring bred an example in which the 2 metallic spots are united in each wing. Var. *coalescens*, Schultz, 1905, to which Hampson's name *festucella* must fall, and another with left wing normal and right wing with united spots.

These insects he very generously returned to me.—A. J. WIGHTMAN, Pulborough, Sussex.

⁵
CORRECTION OF NAME OF *HADENA CAESIA*, SCHIFF., VAR. *MANANI*, GREGSON.—While searching the older volumes of *The Entomologist* to obtain data in connection with *Lycaena phlaeas*, I noticed that since the variety was first described by Gregson, the name of *manani* has been used wrongly instead of *mananii*.

The original description is in Vol. 3 of *The Entomologist* (1866), page 103, there named (and described) as *mananii*, a form of *Hadena* (*Dianthoecia*) *caesia*, Schiff. The error appears to be Gregson's own, or at least he allowed it to continue, because a few pages further on (page 128) he goes into further details about it under the name of *manani*. Since he is arguing there with W. Parry of Manchester as to his right to name it (Parry having wrongly contested Gregson's action), it may be as well to have the name he really gave to it

Apart from this, there are one or two other items that need correction. Tutt (*British Noctuae*, III, 38-39 (1892)) gives the reference to the original description as p. 104 instead of p. 103 and has wrongly transcribed it as *manani*. Then Mr H. J. Turner (*Suppl. Brit. Noct.*, III, 98 (1943)) has given an incorrect reference to the name *manani* in respect of its first description. Turner correctly classes it as a subspecies, but gives "ssp. *manani*, Greg. (1883), *Yng. Nat.*, IV, 184." That reference is to an article by Robson, not to Gregson's description, and the reference ought to read instead—ssp. *mananii*, Greg. (1866). *Entom.*, III, 103.

Kloet and Hincks (1945)—*A Check List of British Insects*—do not treat this as a subspecies as they should do, considering it is constantly different from the Continental nominotypical form. The entry there ought to be amended to "[*caesia* (Schiff. 1775)] s. *mananii* (Gregs. 1866)."

It seems fairly clear that ab. *doubledayi*, Mill. (1886) is a synonym of s. *mananii*, Gregson (1866).—P. SIVITER SMITH, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.

CURRENT NOTES.

THE *Tidskrift* (Stockholm) has begun its 70th volume with two hefts, 128 pages, 2 plates and a number of page illustrations equivalent to plates, with a good sprinkling of text figures. It is not defaced by a multitude of scratchy lines, indicating genitalia of use but to the very few, if any.

DRURY.—In the March issue of the *Entomologist's Record* in "Current Notes" you ask what became of the collection of Drury. In the *Edinburgh Encyclopedia*, 9, 66 (1815), Dr Leach says of the collection, "That it was one of the most extensive ever made and is said to have contained, in species and varieties, no less than 11,000 insects . . . His Museum of Entomology was disposed of in London by public auction, and produced about 600 pounds. One insect, viz., *Scarabaeus goliathus*, was purchased by Mr Donovan for 12½ guineas, who obtained also all the British Insects (which were very numerous) . . ."

Presumably Donovan incorporated these insects in his own collection.

Drury was well known to Sir Joseph Banks, and I feel that it is probable that part of Drury's collection may have been acquired by him. In which case I believe it will be found in the British Museum.

I have the following references, which I have not seen, except the first, to Drury:—

Griffin, F. J. (1942). "Henry Smeathman," *Proc. R. Ent. Soc. Lond.* (A), 17, 1-9.

Cockerell, T. D. A. (1922). "Drury, an 18th Century Entomologist," *Scientific Monthly*, 17, 67-82.

Griffin, F. J. (1940). *Proc. R. Ent. Soc. Lond.* (A), 15, 51.

I trust that this information may be of use to you.

With regard to the note "Curious," I should like to add one of my own entitled "Curiouser"—there is in a bookshop I know a copy of Frohawk's *British Butterflies* priced at £10 10s, and labelled *very rare*. There are no less than 3 copies of this *very rare* work reposing unsold and gathering the dust of ages upon them.—BRIAN O. C. GARDINER, 34a Storeys Way, Cambridge.

[For nearly three months personal circumstances have been quite adverse to carrying on normally. This letter was not acknowledged, nor did I correct my stupid error to which the writer referred. Further, the Drury MSS., to which I referred, has unfortunately been mislaid.—HY. J. T.]

May I correct what I feel sure was an inadvertant slip on p. 30 of the March *Record*. Drury's book was published not in the 17th century, but the 18th, being dated 1770-82. The MSS. which are mentioned must, of course, also be 18th century or later, since the famous Whatman paper mill near Maidstone was only founded in 1731. Incidentally, it is interesting to note that a very famous book, Moses Harris's *Aurelian*, was printed on Whatman paper, and a study of its watermarks show that many copies, although dated 1766 on the title-

pages, were printed in 1794 or 1810. This practice of putting the date in the watermark is a very useful one.—J. O. T. HOWARD, 551a Finchley Road, N.W.3, 26th March 1949.

INADVERTANTLY I made the error of placing Drury in the 17th century, instead of the 18th. It would have been acknowledged had I not unfortunately mislaid or lost the material I had ready to publish.—HY. J. T.

ZTS. DER WIENER ENT. GES., LX, No. 3 (March 1949), contains, *inter alia*, an article by H. Foltin (pp. 39-42) on *Biston isabellae*, Harrison, as compared with *B. lapponaria*; also two new forms of [*Olindia*=] *Anisotaenia ulmana*, by K. Burmann (pp. 43-44, T. 2, H. 3-6), ab. *cruciana* (Fw. band reduced to a cruciform mark) and ab. *obscurana* (Fw. band reduced to costal and medial dots).—T. B. F.

MITTEILUNGEN DER SCHWEIZ. ENTOM. GESELLSCHAFT, XXI, Heft 1 (10.viii.1948). W. Büttiker has a long paper (pp. 1-148, 46 figs.) on the Biology and Distribution of some Mosquitos in Switzerland; all the species dealt with occur also in England. J. Münster (pp. 159-179, 2 figs.) on Aphids carrying Virus Disease of Potato.

Heft 2 (25.viii.1948). E. Fischer (pp. 201-209, 2 coloured plates). Hybrids with *Celerio lineata-livornica*. P. Weber, Wing-shape and Venation of the European Gelechioidea (pp. 215-232, 16 plates). W. Rey, Migration of Lepidoptera (pp. 233-248). F. Schneider, The Biology of Some Syrphidae (pp. 249-285, 19 figs.).

Heft 3 (25.x.1948). Haller, Morphological, biological and histological researches on Metamorphosis in Trichoptera (*Hydropsyche*) (pp. 301-360, 39 figs.). R. L. Clausen, Chemical Warfare on the Common Cockchafer (pp. 403-444, 5 figs.). H. Gaschen, Control of Mosquitos in Canton Vaud (pp. 445-452). V. Delucchi and M. Martignone, First results of a Study of *Rhopalosiphoninus latysiphon*, Davidson (pp. 453-464, 12 figs.) [perhaps not the same as the species recorded in England by Theobald].

Vol. XXII, Heft 1 (25.iv.1949). H. A. Schaefer, The Psyllidae of Switz. (pp. 1-96, 41 figs.). R. Lotman, Feeding and Digestion of *Stomoxys calcitrans* (pp. 97-115, 14 figs.).—T. B. F.

WERNEBERG: *Beitrage Schmett.*, Vol. I, pp. 38-489 (1864), catalogues the whole of the species in these 6 "*Mantissa*" of Fabricius.

1775—In Systema Entomologicae. 1 Band.

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1781—Die Species Insectorum. 2 Bande.

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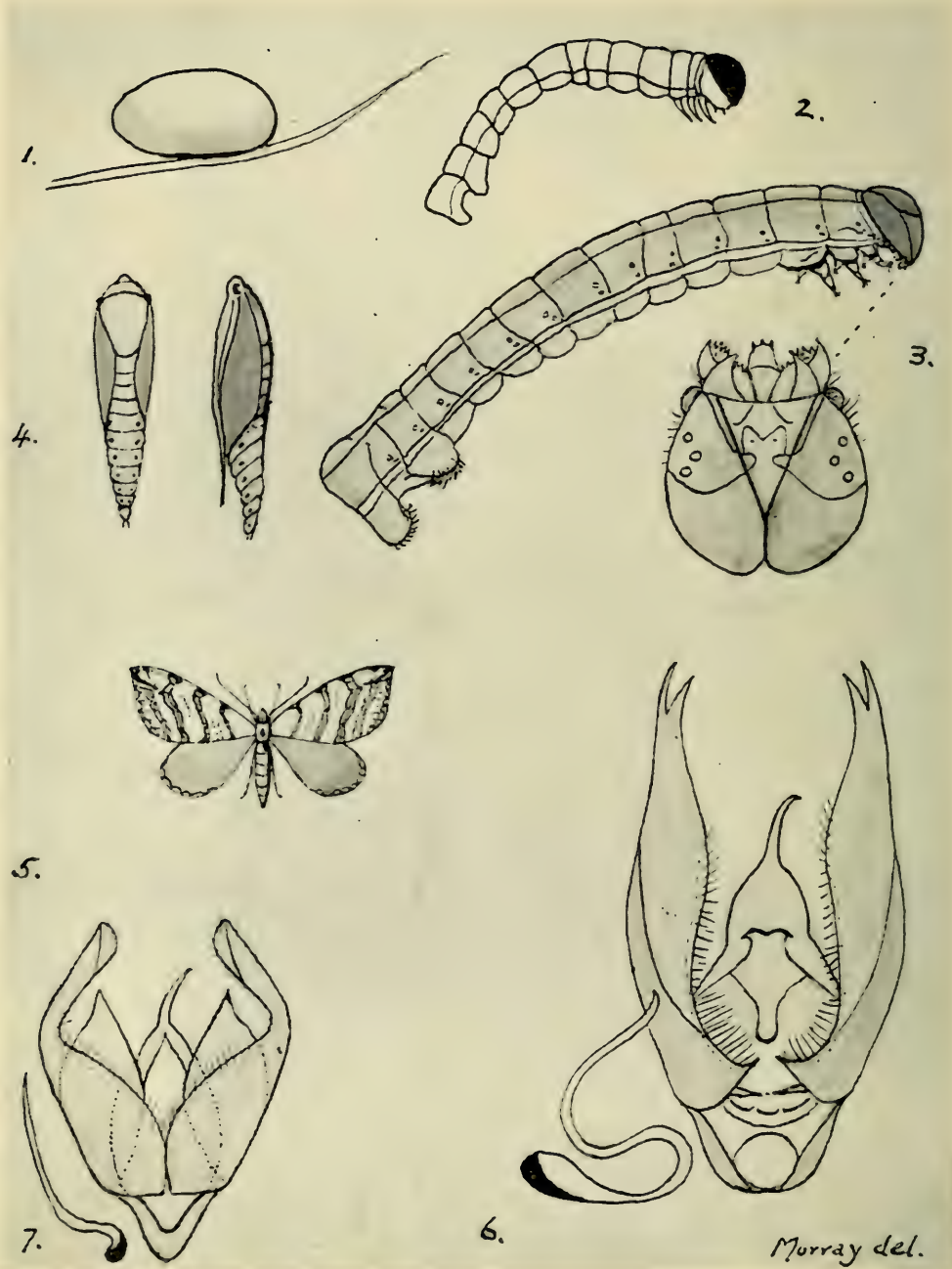
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FURTHER NOTES ON INSECT VISITORS.

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FURTHER NOTES ON INSECT VISITORS TO THE FLOWERS OF SEA ASTER, *ASTER TRIPOLIUM* LINN.

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By L. PARMENTER, F.R.E.S.

The Sea Aster occurs along almost the whole of the British coasts but the records of its insect visitors seem remarkably scanty. In 1942 a list of 2 species of Coleoptera, 5 of Hymenoptera, 10 Diptera and *Lycaena phlaeas*, L., the only Lepidopteron, were recorded, *J. of Ecol.*, 30: 392-3. The following year I made a point of examining some Sea Aster plants when in Cornwall in August and was able to add 3 species of Lepidoptera and 2 Diptera to the list, 1944, *J. Soc. Brit. Ent.*

Much to my surprise I have not found any further notes or records published. Surely other entomologists have collected off, or have seen insects visiting Sea Asters. My next opportunity to examine some of these flowerheads came in 1947 when I found two Syrphidae—*Tubifera* [*Eristalis*] *tenax*, L., and **Tubifera arbustorum*, L., taking nectar from this flower at Stone, Kent. This added one more species to the list, for *arbustorum* had not previously been noted.

In 1948 I was luckier and was able to study the plant in Pembrokeshire and Dorset, finding a number of species taking its nectar. The localities were a small patch in the Gann estuary near Dale, Pembs., and a large area of marsh near Weymouth. About one hour was spent on the work on each occasion. It was sunny on both days at Dale but dull at Weymouth. The list is as follows:—

COLEOPTERA. *Cantharidae*. **Rhagonycha fulva* Scop., Dale, 3rd August.

LEPIDOPTERA. *Pieridae*. **Pieris napi* L., **P. rapae* L., *Satyridae*. **Maniola tithonus* L., all at Dale, 3rd August.

HYMENOPTERA. *Apidae*. *Apis mellifera* L., abundant at Weymouth, 18th August.

DIPTERA.

| | Dale. 3rd Aug. | Dale. 7th Aug. | Weymouth. 18th Aug. |
|--|---------------------------|-------------------|------------------------|
| <i>Empididae</i> . * <i>Empis livida</i> L. | 1♂ | — | — |
| <i>Dolichopodidae</i> . * <i>Dolichopus grisei-</i> <i>pennis</i> Stann. | — | — | 1♀ |
| * <i>D. nubilus</i> Mg. | 1♂ | — | 1♀ |
| * <i>D. plumipes</i> Scop. | — | — | 1♂ |
| <i>Phoridae</i> . * <i>Phora aterrima</i> F. | 1♂ (det. C. N. Colyer) | — | — |
| <i>Syrphidae</i> . * <i>Paragopsis</i> [<i>Eumerus</i>] <i>strigatus</i> Fln. | 1♂ | — | — |
| * <i>Cheilosia</i> [<i>Pyrophaena</i>] <i>grandi-</i> <i>tarsa</i> Forster | — | — | 1♂ 1♀ |
| * <i>Episyrphus</i> [<i>Syrphus</i>] <i>balteatus</i> Deg. | — | — | 1♂ 1♀ |
| * <i>Metasyrphus</i> [<i>Syrphus</i>] <i>consisto</i> Harr. [<i>corollae</i> Fab.] | — | 1♂ | 1♂ |
| * <i>Paragus tibialis</i> Fln. | 1♂ 1♀ | — | — |
| <i>Platylabus</i> <i>manicatus</i> Mg. | 1♀ | — | 3♀ ♀ |
| * <i>Sphaerophoria rüppellii</i> Wied. | 1♂ | — | — |
| * <i>S. scripta</i> L. | 1♂ | 3♂ ♂ | 1♂ |
| * <i>Sulcatella metallina</i> Fab. | — | — | 1♀ |
| * <i>Syrphid</i> <i>pipiens</i> L. | 1♂ | 2♂ ♂ | 3♂ ♂ |
| * <i>Tubifera</i> [<i>Eristalis</i>] <i>arbustorum</i> L. | — | — | 1♀ |
| <i>T. [E.] lyra</i> Harr. [<i>abusivus</i> Collin] | — | — | 2♀ ♀ |
| <i>T. [E.] tenax</i> L. | — | — | 7♂ ♂ 10♀ ♀ |

| | | | |
|--|-------|-----|------------------------|
| <i>Trypetidae. *Paroxyna plantaginis</i> | — | — | 1♂ |
| Hal. | | | |
| <i>Coelopidae. *Coelopa exima</i> Stenh. | — | — | 1♀ |
| <i>Cordiluridae. Scopeuma [Scatophaga]</i> | — | — | 17♂♂ |
| <i>stercorarium</i> L. | | | |
| <i>*Scatomyia [Scatophaga] litorea</i> Flin. | 1♂ 1♀ | 2♂♂ | — |
| <i>Larvaevoridae. *Eriothrix rufomaculatus</i> Deg. | — | — | 1♂ |
| <i>Calliphoridae. *Calliphora erythrocephala</i> Mg. | — | — | 1♂ 4♀ |
| <i>*Lucilia sericata</i> Mg. | — | — | 2♂ 1♀ |
| <i>*L. silvarum</i> Mg. | — | 1♂ | — |
| <i>*Melinda gentilis</i> R.D. | — | — | 1♂ |
| <i>*Onesia agilis</i> Mg. | 2♂♂ | 2♂♂ | — |
| <i>Onesia</i> species indet. | 1♀ | — | — |
| <i>*Sarcophaga carnaria</i> L. | 1♂ | 1♂ | 1♂ |
| <i>Sarcophaga</i> species indet. | — | 1♀ | — |
| <i>Muscidae. *Caricea tigrina</i> Fab. | — | — | 2♂♂ |
| <i>*Musca autumnalis</i> Deg. | — | — | 4♂♂ 6♀♀ |
| <i>Orthellia caesarion</i> Mg. | 1♀ | 1♀ | 47 (sexes about equal) |

Nomenclature is that of *A Check List of British Insects* by G. S. Kloet and W. D. Hincks with some synonyms [in square brackets] to assist those using Verrall's List.

Those marked * are additional to the lists previously published and indicate the scope for simple original work suitable for most amateur entomologists.

One is tempted to comment despite the still meagre amount of study. The inclusion of 3 species of *Dolichopus* surprised me as I previously had but one record of a *Dolichopus* visiting a flower—*Dolichopus unguatus*, L., on *Heracleum sphondylium*, L. (Hogweed).

Orthellia caesarion, Mg., was particularly abundant in the Weymouth salt marsh and although this would account for its preponderance in the above table it must be noted that it seems a constant visitor, for it was found in Cornwall in 1943 as well as in both Pems. and Dorset in 1948 on this flower.

One of the most abundant flies in the Weymouth marsh was the Trypetid—*Paroxyna plantaginis*. Curiously only one specimen was seen on the flowerhead, a ♂ taking nectar, when the species is known to breed in the flower heads!

The numbers seen of various species and their occurrence in both counties suggests that many of the flies visit Sea Asters regularly. Although I watched carefully, not once did I notice a fly leaving the Sea Asters for other flowers.

REFERENCES.

- Parmenter, L. 1944. *Insect Visitors to the Flowers of Sea Aster, Aster tripolium* L. *J. Soc. Brit. Ent.*, 2: 213.
- Clapham, A. R., Pearsall, W. H., and Richards, P. W. 1942. *Aster tripolium* L. *J. of Ecol.*, 30: 392-3.
- Parmenter, L. 1942. *Dolichopodidae (Dipt.) associated with Flowers*. *Ent. Mon. Mag.*, 78: 252.
- Parmenter, L. 1949. *Eristalis abusivus* Collin (= *Tubifera lyra* Harris) (Dipt., Syrphidae) visiting Flowers of Sea Aster, *Aster tripolium* L. *Ent. Mon. Mag.*, 85: 24.

12th July 1949.

THE OVIPOSITION OF THE SATYRID PARARGE MEGERA, L.

By S. G. CASTLE RUSSELL.

Although I have reared this butterfly from captive females I have never seen the insect depositing in its habitat and under natural conditions. On August the 5th last being on the downs near Gomshall and finding the butterflies on the wing in good numbers, I decided to watch and see if I could detect the female in the act of laying. A pair, both in somewhat worn condition which were indulging in the pastime of sitting head to head and jostling one another, attracted my attention. *Megara* seems to be particularly partial to this pastime which other observers record as a preliminary courtship to copulation. Other species also indulge in the game but in most of the instances I have met with the insects were not in good condition and have parted without pairing: in fact I have never myself seen them pair. Females of many species of butterflies are known to pair more than once and in the case of *Argynnis paphia* it seems to be a habit.

Adverting to the pair that attracted my attention I watched them for a short time until they parted, due I thought, to alarm at my near vicinity. The female flew into the base of a small juniper tree, alighted, and appeared to be busy. After she had moved out I investigated the base of the tree, cutting away the small surrounding dead branches. There on stalks of dead grass I found five freshly laid eggs green in colour. Previously I had noticed many females diving into the bases of juniper trees, and had assumed that they did so to escape from me. It seems, however, that their purpose was to oviposit, and I confirmed this by examining a number of bushes into which I had seen females dive. In each instance I found a few freshly laid eggs together with some that had evidently been laid previously as they had changed colour.

It would appear therefore that the procedure adopted by the female in the wild is to lay eggs on dead grass under bushes and not on green grass in the open.

I have found that the female in captivity prefers to lay on the dead stalks of grass at the base of a potted grass plant, although a few are deposited on the green blades.

They will also lay freely on fabric in the cage, and on one occasion deposited rows of eggs on some worsted threads which hung from the top. This habit is not peculiar to *megera* as the fritillaries seem to prefer to lay on anything but their food-plant when in captivity, although they do deposit some. *Argynnis paphia* deposit on tree trunks in the wild, but the others are said to lay their eggs on the food-plant or adjacent plants and grass.

ANAITIS PLAGIATA, L.

By Rev. DESMOND MURRAY, F.R.E.S.

Plate 3.

Special interest is attached to this insect, first because the form of the male genitalia show no resemblance to any other species of Geometrid, occurring in these islands, except perhaps to *Carsia paludata*, Thunb., in the form of the female organ and to the other four species,

placed under *Chesiadiniæ*, by the acicular or needle-shaped aedoeagus. Secondly, an account of another species separated from it in recent years, i.e. *R. efformata*, Gn., which resembles it so very closely in the perfect insect, (in fact in all the stages), that it is often difficult to see any distinction, though the latter is generally smaller, yet they differ widely in genital structure.

Lastly, because it was one of the insects used (without effect) in an experiment of biological control (1917), of a harmful weed introduced from Europe into Australia, i.e. *Hypericum perforatum*, L., the food-plant of the larva.

An account of this experiment will be found in *Recent Advances in Entomology*, A. D. Imms (1937). The life-history given here of this insect is from personal observation but does not claim to be exhaustive.

(1) *The Egg* is laid singly, sometimes two or three together in the edge of the leaf or on flower-heads of the food-plant; it is white to pale-yellow in colour; the young larva emerges in twelve or thirteen days, both in the spring and autumn broods. This time agrees with the record made by Mr Fenn, as far back as 1892, of the "Duration of the Geomet. in the Ova State" (see Tables, *Ent. Record*, Vol. III, pp. 173 and 225).

(2) *Larva* 1 mm. on emergence, greyish-white in colour, apparently without setae and not differing in form from the full-grown larva, which is reddish-brown in colour, with a dorsal band of pale-yellow; when small it closely resembles the withered petals of the flower. There are two broods, one in May-June, the other generally in late August, varying slightly according to the weather.

The autumn larvae hibernates after feeding up for sometime, but without using any form of hibernisation, commencing to feed again quickly about April. The early summer brood develop at once, but development is always slow as the larva is very sluggish. It passes through, as far as could be observed, four instars.

At full growth the measurement is about 22 mm. in length.

The hibernating larvae feed at intervals up to the end of October, if the weather is mild. After this as the plant withers with the receding sap and effect of early frost, the larva remains stationary, stretched at full length on a dry stem, when the cold increases, it descends to the base of the plant, where there are generally a few succulent leaves and nibbles off and on until the return of the spring months, when the food-plant, a perennial, sends out its new growth. The spring larvae mature in about two and a half months; the autumn larvae take about eight months to maturity. Except for the bristles on the claspers the larva shows no setae or only very fine hairs, which perhaps is not unusual with a Geometrid.

It is difficult to see how the larva of *plagiata* or *efformata* could help in any way in the control of a pest plant, the amount it eats of the shrubby, strong growing *Hypericum* is infinitesimal, it is also infested with a number of parasites, at least in this country, so appears to be the weakest possible weapon to use, in any form of biological control.

(3) *The Pupa*; to pupate the larva falls off the food-plant, secretes itself amongst the debris where it changes to a pupa in less than a week, apparently without any form of web but works itself under the light soil, if there is any.

The pupa is light-brown in colour, without any markings, 15 mm. in length, with the end of the antennae sheath projecting from the case. It remains in this state for three weeks or more according to temperature; damp conditions generally hasten emergence.

(4) *The Imago*: *A. plagiata*, *Exp.* 30-38 mm.—*A. efformata*, *Exp.* 25-30 mm. is generally paler and not so definitely marked. In colour the perfect insect is a French grey, with three dark cross bars on the forewing, giving the English name *Treble Bar*; the hindwing is a very light-brown. In newly-emerged specimens the angle of the forewing has a pale-crimson suffusion. The autumn brood is sometimes, (but not always), larger than the early summer brood and the female slightly larger than the male. The moth is beautifully marked, if it was not a common insect it would probably be so considered. The sexes do not differ in colouring, even the antennae do not show a marked difference. *Plagiata* seems to be generally distributed over England, wherever the food-plant occurs in any quantity, a favourite habitat for the plant is on railway embankments.

One observer found larvae recently on the Lancashire sand hills, where the plant has recently appeared though unknown there before; (See *Trans. S. Lond. Ent. Soc.*, Vol. 1945-46, p. 74).

Five or six aberrations have been named, differing principally in the width and density of the treble-bars or the absence of these.

Efformata seems to occur only on chalk in the south of England; the two species often fly together. Comparison of the male genitalia show how very distinct are the two species.

(5) *The food-plant* is generally *Hypericum perforatum*, L., St John's-wort, but other near species are used; in recent years the insect has discovered the large flowered and large leafed garden plant, *H. calycinum*, L., or Rose of Sharon, in some places.

(6) *Parasites*: From a number of larvae bred during the last few years, four different single parasites emerged from the autumn brood.

Mr G. J. Kerrick of B.M. kindly named them as 1. *Micropotetes* sp. 2. *Apanteles* sp., two other small *Chalcids* not yet identified.

The author has to thank Mr S. Wakely for specimens received in several stages of both species.

EXPLANATION OF PLATE.

1. Egg $\times 15$.
2. Larva on emergence $\times 15$.
3. Larva last instar $\times 5$, head of same further enlarged.
4. Pupa $\times 3$.
5. Imago σ , natural size.
6. Male genitalia $\times 20$.
7. Male genitalia $\times 20$. *A. efformata*, Gn.

THE EMERGENCE OF A FEW SPECIES OF BUTTERFLIES IN SERRANIA DE CUENCA DURING THE YEAR 1928.

EXPLANATION OF THE SIGNS.

Climate: (A) coldish, unsettled weather until June 25th. (B) moderate heat. (C) hot. (D) the heat decreases. (E) a storm occurs almost every day until August 24th, high temperature. (F) the temperature

decreases. (G) very hot. (H) a wave of cold. (I) the stormy weather ends. (J) unsettled weather, heat. (K) moderate heat. (L) some showers. (M) heavy rains. (N) lovely climate. (O) frequent rains. (P) the temperature drops. (Q) rains and cold. (R) of fine climate, but on November 1st it snowed.

Occurrence of fresh specimens: s=scarse; f=frequent; p=plenty.

| Date | Climate | <i>P. rapae</i> | | <i>L. sinapis</i> | | <i>I. lathonia</i> | | <i>P. icarus</i> | | <i>L. bellargus</i> | | <i>P. onopordi</i> | | (!) | (!) | (!) | <i>M. phoebe</i> | | <i>M. didyma</i> | | <i>L. albicans</i> | | <i>L. caucasica</i> | | <i>L. coridon</i> | | <i>P. frutillum</i> | |
|------------|---------|-----------------|---|-------------------|---|--------------------|---|------------------|---|---------------------|---|--------------------|---|-----|-----|-----|------------------|---|------------------|---|--------------------|---|---------------------|-----|-------------------|---|---------------------|---|
| | | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | |
| May 20-25 | A | f | s | s | s | s | s | s | s | f | s | s | s | p | f | s | s | | | | | | | | | | | |
| „ 26-31 | - | s | f | f | s | f | s | f | s | p | p | s | s | p | p | f | s | | | | | | | | | | | |
| June 1- 5 | - | s | | s | s | f | s | s | s | f | p | s | s | f | f | s | s | s | | | | | | | | | | |
| „ 6-10 | B | s | | s | s | s | s | s | s | s | s | s | s | s | f | s | s | f | s | | | | | | | | | |
| „ 11-15 | C | | s | s | s | f | f | s | f | s | s | s | s | s | f | s | p | s | p | s | | | | | | | | |
| „ 16-20 | - | | s | s | s | f | | s | s | s | s | s | s | s | s | | p | s | p | f | s | | | | | | | |
| „ 21-25 | D | | s | | | s | | s | s | s | s | s | s | | | s | p | s | p | p | p | s | | | | | | |
| „ 26-30 | E | s | s | | | | | s | s | s | s | s | s | | | s | (+) | f | f | p | p | p | s | | | | | |
| July 1- 5 | - | s | s | | | f | | s | s | | s | | | | | s | p | s | p | f | p | s | | | | | | |
| „ 6-10 | - | s | s | | | s | | s | s | | | | | | | | s | s | p | f | p | s | s | | | | | |
| „ 11-15 | F | s | s | | | s | | s | s | | | | | | | s | p | s | p | f | p | f | | | | | | |
| „ 16-20 | G | s | s | s | | | | s | s | | | | | s | s | s | f | s | s | s | p | f | s | s | s | s | | |
| „ 21-25 | - | s | f | s | s | f | | s | s | | | s | | s | s | s | p | s | s | s | p | f | s | s | s | s | | |
| „ 26-31 | - | s | s | s | | p | s | s | | | | | | s | s | s | f | s | (+) | s | f | s | s | s | s | | f | |
| Aug. 1- 5 | - | f | f | f | s | | | s | s | | | s | | s | s | s | s | s | s | | s | f | s | p | p | s | s | f |
| „ 6-10 | - | f | s | s | s | | | s | | | | | | s | s | s | s | s | | | s | | p | p | s | s | s | |
| „ 11-15 | - | | | s | | | | | | f | | s | | s | s | s | s | s | (+) | s | (+) | p | p | (+) | p | s | s | |
| „ 16-20 | H | | | s | | | | | | p | s | s | s | s | s | s | f | s | s | | | | f | s | s | p | s | |
| „ 21-25 | I | f | f | | | f | s | f | s | p | s | f | | s | s | s | p | f | f | s | s | s | s | f | s | s | p | |
| „ 26-31 | J | | s | | | s | s | f | s | p | s | s | s | s | s | s | f | f | f | | s | s | s | s | s | s | s | |
| Sept. 1- 5 | - | p | f | | | p | s | f | f | p | p | s | s | f | s | s | p | f | s | s | s | s | s | s | s | s | s | |
| „ 6-10 | - | p | | | | p | s | f | s | f | s | | | | | s | s | s | | s | | | | | | s | | |
| „ 11-15 | K | f | f | | | | | | | f | p | | | | | s | s | s | | | | | | | | | | |
| „ 16-20 | - | f | f | | | | | f | f | f | p | | | | | s | | | | | | | | | | | | |
| „ 21-25 | L | | s | | | | | s | s | f | f | | | | | | | | | | | s | | | | s | | |
| „ 26-30 | M | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oct. 1- 5 | N | f | | | | s | | f | f | f | f | f | | | | | | | s | | | | | | | | | |
| „ 6-10 | - | s | s | | | | | s | s | f | f | s | s | | | | | | | | | | | | | | | |
| „ 11-15 | O | | | | | | | | | | | s | s | | | | | | | | | | | | | | | |
| „ 16-20 | P | f | | | | | | f | f | | s | | s | | | | | | | | | | | | | | | |
| „ 21-25 | Q | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| „ 26-31 | R | s | s | | | | | s | s | s | s | s | | | | | | | | | | | | | | | | |

(+) See the explanatory notes.

(!) *Spialia hibiscæ*, Hb. = *Powellia sao*, Hb.; *Lysandra argester*, Bgstr. = *Lycaena hylas*, Esp.; *Pyrgus fritillum*, Schiff. = *Hesperia cirsi*, Ramb.; *Coenonympha lyllus*, Esp., the exurge of *pamphilus*, L., according to Verity.

(+) The first brood of *argester* emerged from 30th May to 15th August. The lack of a sign, in the table, by the end of June, does not mean that specimens of that species had ceased to emerge on those days. It was due to the fact that while making my tables at Barcelona I did not find in the set, at which I was looking, any specimens labelled with those dates because at that time we went and collected to higher places,

above Ugna, where *argester* did not live. While coming home we were unable to catch at Rincon de la Laguna, where those butterflies were flying, owing to the daily storms in the afternoon. The second brood of that species was on the wing from 19th August to 16th September.

The apparent lack, in my table, of *phoebe*, *albicans* and *coridon*, from 11th to the 20th August, is due to another cause. Generally, my wife and I caught in different places to get diverse local species on the same day. My wife went to Rincon de la Laguna, I walked far. At mid-August my wife was not well. I made some trips to Rincon del Juez chiefly to follow the development of *P. fritillum* (that I shall relate by a further paper). There I took *L. caucasica* and other species, but I saw neither any *albicans* nor *coridon*. Coming back I collected some *argester* near Ugna and soon went home to nurse my wife. When on August 21st, and later on, we visited again the meadow and path of Rincon de la Laguna, where both *albicans* and *coridon* live, we found there many worn specimens of this kind together with some recently emerged ones.

Conclusion.—From what I have related, and from what I noted in 1924 at Albarracin, and at Ugna in 1926 and 1933, I infer that *albicans*, *coridon* and *caucasica* are single-brooded species emerging almost at the same time when it is cold and rainy in the spring. In very dry seasons, as it happened at Albarracin, Montarco, and, in 1926, at Ugna, *albicans* emerged in June, before its two allied species, but it did not produce a second brood in summer.

Instead, *hispana* is a double-brooded species not only near Florence and Barcelona, but in any locality (Southern France, Riviera) where it has been found. It remains double-brooded on mountains. As I have already recorded, we took *hispana*, both in the spring and summer, on Mt. Fanna, 2000 ft. In the Museu de Catalunya at Barcelona there are specimens, taken by Dr Font Quer in alpine surroundings, and in October, on Sierra de Almuçara (Southern Spain) and at Puerto de Tortosa (Southern Catalonia), more than 3000 ft. Perhaps we have also taken *hispana* along the banks of Guadalaviar river in front of Albarracin, 3300 ft.

Sagarra and I noted that the upperside of the wings of *albicans* is almost white, that of *hispana* is greenish bluish suffused with grey scales; the disco-cellular spots are often prominent. the marginal bands are large and deep brown. On the underside the spots are big and deep black: the orange lunules, around the black spots, along the margin of the hindwings, are intensely coloured and often they are visible on the upperside. Mr Ball, living at Brussels, noted some differences between the androconial scales of *hispana* and *albicans*. *Taisandra hispana* emerge in the same manner as *Bellargus*. Around the lake of Ugna, where the climate seems to be still more favourable to insect-life than in many lowlands, the first brood of *bellargus* emerged, in 1928, from May to the beginning of July; the second brood was more or less on the wing from mid-August to the November frost. If *hispana* would be co-specific with *albicans* it ought to emerge, at Ugna, like *bellargus*, and not to be a single-brooded species. In any place of Serrania de Cuenca we never saw any specimen which might be referred to *hispana*. Perhaps we have not discovered where the localized room lives.

Orazio Querci.

OBITUARY.

CAPTAIN RUPERT STANLEY GWATKIN-WILLIAMS, C.M.G., R.N.
1875-1949.

Captain R. S. Gwatkin-Williams had an adventurous life. He went to sea in the *Imperieuse* as a midshipman in 1891, served on the China Station, and was present at the taking of the Taku Forts. He served through the Boxer campaign, took part in the capture of Peking, and witnessed the looting of the Summer Palace. After his retirement in 1912 he was in the coastguard service in Ireland and became an ardent entomologist. Stationed at Queenstown he made a collection of Irish Lepidoptera, which was sold some years later at Stevens's Auction Rooms. He bred numbers of cream-coloured males of *Cyenia mendica* and a reddish form of *Lithophane socia*, and took a fine series of *Celaena leucostigma*, but his greatest prize was a *Leucania loreyi*, which he found on ivy blossom.

On the outbreak of war in 1914 he rejoined the Navy and was placed in command of H.M.S. *Tara* serving first off the coast of Ireland and later in the Mediterranean. Torpedoed in the Gulf of Sollum he was taken prisoner and handed over to the Turks, who placed him in the hands of the fanatical Senoussi. He spent several months of great hardship in the Libyan desert. Enduring burning heat by day and bitter cold at night, he and his crew, almost starving, lived for a time largely on snails, but eventually the survivors were rescued by the Duke of Westminster's armoured cars. The thrilling story appeared in his little book, "In the Hands of the Senoussi," published in 1916.

After his recovery he spent nearly two years in command of H.M.S. *Intrepid* as Senior Naval Officer at Yukanski on the Murman Coast of Russia. During his first season in the Arctic he made a small collection of Lepidoptera including *Erebia disa*, which he found common, but very local.

Through his influence I became surgeon to the *Intrepid* and got to know him very well during his second season in the Arctic. Tall with a large red face, he was an imposing figure, and though he could be severe he was kind hearted and so popular with his crew, that almost all volunteered to serve under him again. He was an entertaining raconteur, full of ideas, and so enthusiastic that no one could be dull in his company even in that desolate land. The task of keeping the seaways to the White Sea free from mines for the convoys going to Archangel and Kem ended in December 1917 when the Bolsheviks seized the Russian warships and the town of Murmansk. On his return he wrote the story in his book, "Under the Black Ensign," which I have heard described as one of the best of the war books.

In 1918 he became commodore of the ocean escorts of the convoys bringing American troops across the Atlantic.—E. A. C.

COLLECTING NOTES.

ELACHIPTERA DIASTEMA, COLLIN (DIPT., CHLOROPIDAE) IN SURREY.—In 1946, *Trans. R. ent. Soc. Lond.*, 97: 146-7, Mr J. E. Collin first described the above species and particularly compared it with the widespread *Elachiptera cornuta*, Flin. He recorded it from Cambs., Dorset, Oxford and Suffolk, and in the months of March, April, August and September. On 13th February, a cold, frosty day at Bookham Common, Surrey, Messrs F. D. Buck and R. D. Weal were industriously working through some grass tufts for Cöleoptera and allowed me to pick up the Diptera present—mostly small Sphaeroceridae and Sepsiidae. Amongst the 16 flies taken were 2 ♀♀ *E. diastema*. This early date suggests that *diastema*, like *E. brevipennis*, Mg., and *E. cornuta*, Flin., overwinter as adults. I also found *cornuta* on the same day in Mr Buck's beating tray when a mass of dead Clematis draping a Holly was being "dealt with."—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey, 5th April 1949.

DIANTHOECIA COMPTA.—The readers of the *Entomological Record and Journal of Variation* will, I feel, be interested in the following observations. On 23rd June 1949, at 9.55 p.m., I had the good fortune to take at Dover a ♂ example of *Dianthoecia compta* in perfect condition. It came to the bloom of Sweet William, and as far as I could see did not hover over the flowers, but apparently settled at once, remaining quite motionless on one of the heads. The night was a cold one with a moderate North-East wind (only slight at the place of capture since the exact location is a sheltered one), and this coldness I feel no doubt accounted for the insect's inactivity. On 27th June I was once more at the same spot and took a further example of *compta*—a ♀ this time but not in quite fresh condition. On this occasion the weather was rather warm with no wind or cloud. I first observed this second specimen at 10.45 p.m., hovering over the flowers of Sweet William, and it occurred to me that it might have been depositing; however, I was unable to make sure. I have kept the flower-heads over which it flew in the hope that they may contain ova.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent, 7th July 1949.

H. SUASA IN SUSSEX.—With reference to Mr A. J. Wightman's note on *H. suasa* in the *Ent. Rec.* for July-August 1949, this has been the commonest Noctuid I have met with this year. The first specimen I took on 25th May, and it was still in fresh condition on 16th July.

In 1930 and 1931 I took and bred it from the Cosham Marshes, Portsmouth, and never obtained anything but the *suasa* form, Bkh., described by Warren (Seitz, Vol. III) as pale leather-brown. This form is well shown in South's *Moths of the Br. Isles*, Vol. I, Pl. 121.

I never take this form now, all my captures being much darker, including *confluens*, Ev.

I took in addition this year a small grey form, which, so far, I have been unable to find illustrated.

From dark females captured this year I have about 200 pupae, and shall await their emergence next year with interest.

Larvae were fed on dock, which they ate readily.—A. H. SPERRING, Slindon, Fifth Avenue, Warblington, Hants.

A SEARCH FOR *H. SUASA*, HAYLING ISLAND.—A friend wanting this species, I took him to one of its haunts on Hayling Island on the 25th June this year. I usually take it on the long grasses on the sea banks; but we were unable to find it there. It was very common on the nearby mud flats from about 11 p.m.-1.30 a.m. (Summer Time). From midnight onward, one could pick up as many pairs as wanted. These mud flats are intersected with creeks, and at very high tides are covered with water, so the larvae and pupae must be submerged at times. Some pairs were found far out on cord grass. All the pairs taken were of the *favicolor* form with one exception, a ♂ *pallens* × ♀ *favicolor*. This is the only case of this pairing I have ever seen, and I have taken many in the course of years' collecting. Unfortunately, the ♀ escaped before ova were deposited.

Males fly wildly to light, but are hardly worth taking, as pairs in good condition can be taken later.—A. H. SPERRING, Slindon, Fifth Avenue, Warblington, Hants., 1st August 1949.

EASTWARD SPREAD OF *HYLOICUS PINASTRI*.—On 2nd August 1949 I found a male of *H. pinastri* under a street lamp in London Road, Croydon. Although rubbed in places on the forewings, the moth was obviously fresh as the body scales and fringes were in excellent condition. Whether by natural spread or accidental means the insect arrived in Croydon there is sufficient pine scattered about the area to enable the species to gain a foothold.—F. V. L. JARVIS, 21 Shirley Avenue, Sutton, Surrey.

HIBERNATION OF *P. ICARUS*.—A large batch of ova was obtained from half-a-dozen wild *icarus* females captured in late June. About 250 larvae were reared to the hibernation stage. This species hibernates after some feeding following the second casting of skin. Five only of the larvae did not settle down for hibernation, but fed on rapidly towards a second brood. All the larvae were kept under identical conditions and the bulk of them stopped feeding during a spell of hot weather when the outdoor temperature exceeded 80° F. on several successive days.—T. D. FEARNEHOUGH, 25 Ramsey Road, Sheffield.

C. CROCEUS, VAR. *PALLIDA*, AND *C. VAR. HELICE* IN THE SWANAGE DISTRICT.—Between August 7th and 20th, 103 *C. croceus*, 1 var. *pallida* and 4 var. *helice* were observed within a quarter of a mile of my cottage, which is close to the sea; they were nearly all in fresh condition, especially the ♀♀. A few were flying along the shore, and pitching on the rocks, but the majority were winging over the Downs in a westerly direction.

V. cardui, *V. atalanta* and *V. c-album* are plentiful, the latter rather worn.

It is remarkable that so few *V. io* are to be seen this season. Is there a general scarcity of this usually common species?—LEONARD TATCHELL, Swanage.

D. LIVORNICA AT SWANAGE.—A ♂ specimen of *D. livornica* in excellent condition was taken at light on the evening of August 15th.—LEONARD TATCHELL, Swanage.

CURRENT NOTES AND SHORT REVIEWS.

THE LEPIDOPTERA OF THE KINGDOM OF EGYPT, by E. P. Wiltshire, F.R.E.S., quarto, 100 pp., 76 pls., one coloured, and 68 text-figures mostly of diagrams (genitalia) with a few new species.

This article is one of the most needed guides to a knowledge of the Lepidoptera in the Near East, the more useful will it be because of the experience, knowledge and reliability of the extremely careful author. Knowledge of the literature of Entomology and of the reliability of records increase the value of this admirable Summary.

UNDER the auspices of the Royal Entomological Society a series of booklets are being issued entitled "Handbooks for the Identification of British Insects." The two lying before us deal with (1) Dragonflies and (2) the Dermaptera and Orthoptera. Of the latter volume, Dr Burr will doubtless give us his opinion.

The Odonata (Dragonflies) may illustrate all the methods used. Every outward visible character of every species are figured. These are classified and comparatively figured, e.g., head (eyes, bristles, mouth), wings (fore-, hindwing markings), legs (appendages), thorax, abdomen (marking, appendages), anal (marking, appendages), etc.

The outward visible general appendages fall into their natural position in the classification and are a predominant feature in the classification.

THE BUTTERFLIES AND MOTHS FOUND IN THE DOVER AND DEAL DISTRICT, by Bernard Embry, F.R.E.S., and George H. Youden, F.R.E.S.

This is one of those particularly useful Guides to an area in close proximity to the Continent, and in the past was notorious for an "aliens without genuine passports." In the past this area had the objectionable reputation as the landing place of new species to the country without a reliable passport. So far as we have seen, the present authors have omitted the doubtful records.

Guide books like these seem always to attempt the impossible, to arrange the groups into a sequence which is absolutely impossible as a scientific fact.

In this case there are 8 groups of Butterflies. *Danaidae* are put first followed by the *Satyridae*, *Nymphalidae*, *Nemeobiidae*, *Lycaenidae*, *Papilionidae*, *Pieridae*, and *Hesperiidae*.

The relationship can only be shown by a plant or tree with 8 tubercles each of a different height from base, each representing one of the above groups. Looked at from above the circle of the 8 scattered groups can only show relationship to a very limited extent, not impossible. Then why not always use the early grouping, starting with *Papilionidae*. Hence it would be advisable to the early groups: *Papilionidae*, *Pieridae*, *Satyridae*, *Danaidae*, *Nymphalidae*, *Nemeobiidae*, *Lycaenidae*, and *Hesperiidae*.

In this case the choice of *Danaidae* as the first group has been not unfortunate. The "Monarch" is not *plexippus*, nor is *plexippus* (proper) the Monarch.

Linnaeus, *Systema Naturae* (1755), p. 471.

plexippus.

"Ales primores fascia alba ut in squento cui somelis *chrysippus*."

I have had more than a hundred of the American *Danaidae* and not one had a white fascia like the eastern *Danaidae* of Africa and S. Asia. (The white fascia is irremovable and not likely to be.)—HY. J. T.

THE DRAGONFLIES OF THE BRITISH ISLES, by Cynthia Longfield, F.R.E.S.
2nd edition. Messrs Frederick Warne & Co. Ltd. 260 pp., 58
plts., 12 coloured; 17/6 net.

This volume is one of the very excellent series of works on the natural history of British Insects. In detail and illustration of detail this volume is brought up to date quite equal to the volumes previously issued. Colour is not so important in the work depicting the Odonata, but it is used in all cases where usefully necessary. A section of some 18 pages is entitled "Wings and Bodies of Dragonflies," and consists of 17 plates, each comparatively arranged. The sub-sections: *Venation*, 6 plates and including costal patches (enlarged); *Genitalia*, 1 plate; *Bodies*, 7 plates, also comparatively grouped; *Shape of Prothorae* in the Damselflies (enlarged), 1 plate; *Anal Appendages* (Caudal Lamellae) of Damselflies, 1 plate; *Alternative Pattern* on Bodies of Damselflies, 1 plate. To these should be added 4 plates of figures of the *Nymphs* of Dragonflies arranged in groups, at the end of the volume.

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ADDENDUM TO SOME MORE NEW RECORDS OF LEPIDOPTERA
FROM CYPRUS, IRAQ, AND IRAN.

By E. P. WILTSHIRE.

ADD UNDER PERSIA (IRAN) AGROTIDAE (before *Cardebia albipicta*).

Euxoa robiginosa Stgr.

13-15.x.39, Kermanshah, c. 5000 ft. (garden and enclosed wild hilly ground).

Euxoa cortii Wagner.

19.x.40, Shiraz, c. 5000 ft. (gardens).

Amathes (= *Rhyacia*) *iobaphes* (Boursin).

25.x.39, Kermanshah, c. 5000 ft. (garden and enclosed wild hilly ground). A very battered male, the second known example of this rarity, of which I took the type in Lebanon on 26.ix.33.

ADD (after "*Cardebia albipicta* . . . above") :—

Polia praedita Hubn.

20.ix.40, Khan-i-Zinian, c. 6500 ft., scrubby hills, Fars.

Procus aerata Esp. (= *latruncula*).

17.vi.39, Derband, nr. Tehran, c. 6000 ft. (oasis); 19.vi.38 (6000 ft., oasis), Hamadan.

ADD after "*Crocallis* . . . *Fraxinus*" :—

Gnophos chorista Wehrli.

3.vi.40, 9000 ft., Barfkhaneh, nr. Yezd (arid mountain).

BUTTERFLIES NEAR PARIS, GENEVA, AND ANNECY, 1948.

By R. F. BRETHERTON.

During the summer of 1948 I was obliged to pay several short visits to Paris and Geneva, and, though prolonged collecting was impossible, I was able to snatch a few useful opportunities.

The surroundings of Paris are quite worth exploration by the English collector, though a good deal of local knowledge is no doubt necessary to track down the more local species. In the late afternoon of 22nd May I went out to St Germain-en-Laye. The extensive forest seemed too dense to be suitable for many butterflies, and even on the mile-long Terrasse and sloping bank above the Seine, they were not very numerous. However, some worn *Papilio machaon* were seen, the three common Whites, a couple of *Leptidea sinapis*, *Vanessa atalanta* and *V. cardui* (both worn), *Pararge aegeria*, *Coenonympha pamphilus*, with one *C. arcania*, and many *Polyommatus icarus*. A number of *Haemorrhagia fuciformis* were about, and *Euclidia glyphica* abounded.

A more profitable "near-in" locality is the Bois de Meudon, which can be reached in twenty minutes by electric train from the Invalides. Here the woods are more open, with some heather and broom, and there are marshy spots where the hemp agrimony and other insect-attracting flowers abound. A warm afternoon there on 24th July yielded about

twenty species of butterflies. The most notable was *Araschnia levana prorsa*, which was flying not uncommonly to bramble blossoms, though beginning to get worn. I had not before seen the second generation of this insect at large, and was much struck by its resemblance on the wing to a diminutive *Limenitis sibilla*, L. The second broods of *Argynnis selene* and *L. sinapis* were beginning to emerge, and those of *Heodes dorilis* and *Lycaenopsis argiolus* were already common. The former almost replaced *H. phloea*s, which seems relatively scarce round Paris. *Gonepteryx rhamni*, *Aphantopus hyperanthus*, and *P. egeria* were all common, and *Epinephele tithonus* was the dominant butterfly everywhere.

Further out of Paris there are, of course, many famous localities. I paid three visits to the Forest of Fontainebleau. There butterflies seem to be very localised, and the forest has one great weakness in the total absence of water or even of damp ground. On my first visit, for a couple of hours only on 25th May, I worked an overgrown quarry and the adjacent heath, where butterflies were very numerous. Captures included several *Melitaea cinxia*, a few late *Argynnis euphrosyne*, and fine series of the first broods of *C. arcania*, *H. dorilis*, and *Plebeius medon*. Among the Skippers, *Hesperia serratulae*, *H. malvae* and *H. sao* were all flying together, rather worn, together with a few fresh *Augiades sylvanus*. This insect seems to have a much more prolonged period of emergence here than in England, as it was still about and in good condition at the beginning of August. A fine *Euprepia cribraria* was also taken.

My second and third visits to Fontainebleau were on the blazing Sundays of 25th July and 1st August, which spanned the only heat wave of the summer. I made wide detours through the forest, on the first occasion leaving the train at Bois-le-Roi and crossing the forest as far as Barbizon before returning to Fontainebleau, and on the second going as far as the Gorges de Franchard and returning through an open, grassy region called the Plaine des Puits. These two expeditions yielded thirty-three species of butterflies. *Papilio podalirius*, already taken in May as it circled with several *V. atalanta* round the top of a rocky hill, was again secured. *L. sinapis* and *G. rhamni* were common everywhere. All the three large Fritillaries were about, and a single *A. selene* was seen. Among the Satyrines, *Satyrus hermione* was notable. It occurred singly in many places, but in one spot it was really abundant, flying to and settling on the trunks of oaks and firs, where it was perfectly camouflaged unless approached in silhouette. In this habit it was accompanied by many *S. semele*—a large dark race—and by two or three *Euvanessa antiopa*. One *Pararge maera* was taken, but I was disappointed in the search for *S. briseis*, *S. statilinus* and *S. dryas*, for which I may have been a few days too early. *H. dorilis* was locally abundant, and there were some nice smoky forms of *H. phloea*s. Among the "Blues," *Polyommatus coridon* swarmed in certain places—a very large race with chalky white undersides, but apparently not much given to variation. An interesting find was *Hesperia cirsii*, Rambur, which on 1st August was flying, fresh, but in small numbers, in the old quarry.

The Forest of Chantilly was also visited. The part near the town is dense and rather flowerless; but further in, near the chain of arti-

ficial lakes, felling during the war has produced a more scrubby type of vegetation. My first visit there, on 30th May, was disappointing. as the afternoon turned overcast just as I approached the better ground. *C. arcania* was common, *A. euphrosyne* and *A. selene* were numerous, with one early *A. aglaia*, and I took single specimens of *Melitaea athalia*, *M. dictynna*, and *P. moera*. Among the moths, *Diacrisia sannio*, *Siona lineata*, and *Minoa murinata* were all easily disturbed and common. Late in the season, on the sunny afternoon of 26th September, I was again at Chantilly, walking through the forest from the previous railway station at Coye. Early frosts had disposed of most of the butterflies, and only *Pararge megaera* and *C. pamphilus* were about in any numbers, with the moths *Plusia confusa* and *Anaitis efformata*. There were a few individuals of the common Whites and Vanessids, and the race course at Chantilly yielded single worn *Hesperia armoricanus* and *Colias hyale*—the only one I saw in 1948.

The surroundings of Geneva naturally provided more variety than those of Paris. On 27th June an overgrown garden sloping towards the lake at Prègny gave a couple of hours good sport in brilliant sunshine. *P. machaon*, in fine condition, sailed among the flowers, and a few *Colias croceus* were egg-laying on a patch of lucerne. *Argynnis dia* swarmed, presumably in its second generation, and with it were a few strongly marked *Melitaea didyma*. There were strong broods of *Melanargia galatea*, *Epinephela janira*, and *Polyommatus icarus*, with some worn *P. bellargus*. *Ruralis quercus* was taken at rest on an oak leaf, and several *Hesperia carthami* were seen, of large size and showing abnormally big white markings on the upper side hindwings. *Macroglossum stellatarum*, *E. glyphica*, and other day-flying moths were common. Unfortunately, the weather broke that night, and no further opportunity for day-time collecting occurred during the remaining four days of our stay, though an *Eustrotia trabealis* came in to light.

A later visit to this garden, on 14th September, showed a smaller but still interesting butterfly population. *A. adippe* was still in fair condition, and one female of *A. dia* was taken—presumably part of a third emergence. I was pleased to take two small specimens of *Melitaea parthenie* and several *E. argiades*. *P. icarus*, *P. coridon*, and *P. bellargus* were all common, though mostly worn; and there were also a few examples of *H. armoricanus*, both fresh and worn, flying along with many *Argiades comma*. But the commonest insect at that date was *Plusia gamma*, which swarmed among the lucerne, with a few second brood *E. glyphica* and *Chiasmia clathrata*.

On 3rd July my wife and I left Geneva, still in rain, for the little village of Talloires, on the east side of the Lac d'Annecy. The Hotel de l'Abbaye is on the edge of the lake, sheltered from the north by the outjutting Roc de Chère, and immediately adjoining a steep bank which was prolific in "Blues." Behind this there are steep woods, a terrace of cultivated ground, and then forest, alp, and rock to the mountain tops at over 2000 metres, less than two miles away as the crow flies. The weather improved in the afternoon after our arrival, and I collected on the bank. Besides *P. icarus*, *P. bellargus*, *P. medon*, *L. argiolus* and *Cupido minimus*, the males of *Everes coretas* were abundant, and there were smaller numbers of *Polyommatus thersites*,

Plebeius argus, L. (*argyrognoman*, Berg.), *Everes argiades*, and *Polyommatus semiargus*. A pile of damp and decaying hay was a great attraction, on which were to be seen at one time a dozen or more *E. coretas* and many of the other species. On this day and the next this bank also produced *M. galatea*, *P. moera*, *Satyrus circe* (two newly-emerged males), *C. pamphilus* and *C. croceus*, besides the Skippers *Adopaea lineola*, *A. thaumas* and *Augiades sylvanus*. On the stony and wooded Roc de Chère *Melitaea pseudathalia*, Rev., was just emerging in large numbers—a larger and more lightly marked race than I have seen elsewhere. *A. dia*, *A. paphia* and *A. hyperantus* were also present. On the morning of the second day we walked in bright sunshine along the lake and up the slopes to the deep ravine of the Cascade d'Angon. On the lower ground the dominant butterflies were *L. sinapis*, *P. moera*, and that beautiful Fritillary, *Argynnis daphne*, which was abundant on flowers of bramble and wild mint. In the woods many specimens of *Polygonia c-album* f. *hutchinsoni* and a single *Strymon ilicis* were taken, and in a damp meadow there was an early *Erebia ligea* and several *M. didyma*. *S. hermione* was caught with some difficulty from its resting place on the rocks above the waterfall, and a full-fed larva was picked up which subsequently produced a fine female *Lymantria dispar*.

On the third day we set out early to climb La Tournette (2357 metres), reaching the top about one o'clock and returning in the evening. We did not delay in the pine forest, which extends up to about 1350 metres, but on the way a few fresh *Argynnis amathusia*, a single *Limenitis camilla*, Schiff., and some very rubbed *Aporia crataegi* were taken. On the flowery alps above *Erebia oeme* was plentiful but very weather-worn, *Erebia ceto* was just emerging, and there were a few *Erebia stygne*, Ochs., with innumerable little Geometers, mainly *Psodos quadrifaria*. Between 1600 and 2000 metres butterflies were scarcer, but included *Nisoniades tages*, *Hesperia malvoides*, *Pieris rapae*, *P. napi*, *E. cardamines*, *V. cardui* and a stray *P. machaon*, besides these truly high-level species *Pieris callidice*, *Colias phicomene*, and *Melitaea aurinia* f. *merope*. A fast-flying *Colias*, chased but not captured, was probably *C. palaeno*. Above 2000 metres the rocks were still covered with fresh snow from the storms of two days before, but *Aglais urticae* nonetheless sunned itself on the highest point.

The weather during this day remained fine, despite some threatening clouds. But in the evening the storms broke again, and for the last thirty-six hours before our departure at midday on 6th July rain was almost incessant and collecting impossible. Even so, our week-end had yielded a round fifty species of butterflies and we had reconnoitred a locality which, for its combination of variety, beauty, and ease of access, will be well worth more attention in another season. We left Talloires after lunch, travelling by air from Geneva; we had supper at home in Surrey.

Ottershaw Cottage, Ottershaw, Surrey.

Note.—The nomenclature followed in this article is that of Leon L'Homme, "Catalogue des lépidoptères de France et de Belgique," Volume I, 1923-35.

FORMICA EXSECTA NYL. AS A SLAVEMAKER.

By LAWRIE WEUPHERILL.

In late August and early September 1948 I was on holiday at Aviemore. The season was exceptionally wet in what is normally rather a dry part of the country.

Though I searched hard for *Formica exsecta* and *Formica sanguinea* round Aviemore in most directions I was completely unsuccessful until the last day or two. Strangely enough, the only place where I found *exsecta* was by the track in the Einich Valley, which runs South into the Cairngorms. There in the late afternoon of 7th September, at about 1400 ft., I found a colony.

The next day I returned and spent several hours watching the unusual conduct of some of the *exsecta* workers.

The colony lived partly under a large flattish stone and partly to the side of it; and the size was about the normal for this ant.

After a time I noticed that some of the *exsecta* workers were coming up a steep slope to their own colony from a tiny nest of *Formica fusca* some three or four feet below. While I watched, they carried a small number of *fusca* pupae to their nest and also a few live *fusca* workers. At first three or four *fusca* stood round the entrance—a small hole going vertically into the ground—to their colony and one of them showed its resentment at the presence of the *exsecta* by occasionally nudging one of the latter as it entered. This *fusca* also attempted on several occasions to enter its home. The *exsecta* did not seem to mind much, but eventually one of them picked up the *fusca* and carried it off to its own colony.

All the other *fusca* captives that I saw were brought out of their nest and carried up to that of the *exsecta*. I intercepted four or five of the captives and found that none seemed to be much injured. Probably only those *fusca* which made themselves a nuisance were taken to the *exsecta* colony.

Just before I left I pulled up the stone from the *exsecta* nest and was astonished to see two or three *fusca* workers assisting in the usual scramble to remove pupae. One which was rather apart from the other ants was most certainly acting energetically on its own initiative. In fact, the *fusca* behaved just as though they were in a *Formica sanguinea* colony.

Presumably an *exsecta* female had founded her colony under the stone in a *fusca* nest; but the community, though not of orthodox shape, was of normal *exsecta* size and it was very doubtful if any of the original *fusca* workers could have survived to this stage.

The slave raid was very much like those I have seen *Formica sanguinea* making. There were the following differences, however:—

- (1) The removal of the live *fusca* workers to the *exsecta* nest was strange, especially as they did not seem to be ill-treated.
- (2) The *fusca* workers were not afraid of the *exsecta*, as they certainly would have been of *sanguinea*.
- (3) I did not see any *fusca* workers on grass stems holding pupae; this is, in my experience, an invariable feature of *sanguinea* raids on *fusca*.

A little further down the track I found two more colonies of *exsecta*, both of which were of normal size and shape; neither had any *fusca* among the inhabitants. Much farther down I found one small colony of *sanguinea* in a log. The dreadful weather, of course, made it unlikely that I should readily find this ant and I have no doubt there were other communities near.

I understand from Donisthorpe that 35 years before he had no difficulty in finding both *exsecta* and *sanguinea* close to Aviemore. The extensive felling of trees during the two Great Wars has no doubt reduced their numbers in the meantime, just as it has caused *Formica rufa* to live almost entirely in small or very small colonies. In the undisturbed parts of the Abernethy Forest, incidentally, there are still many very large nests of this species. In several other parts of the surrounding district I looked most assiduously, but vainly, for *Formica sanguinea* in very favourable places, some of which were thickly populated by *Formica fusca*. I feel sure that both *exsecta* and *sanguinea* are now very rare in this part of Scotland.

12 Raeside Avenue, Newton Mearns, Renfrewshire.

ENTOMOLOGICAL EXPERIENCES IN WEST AFRICA, MAINLY TOGOLAND, FOR THE PAST FIFTEEN YEARS.

By Major F. L. JOHNSON, M.B.E., F.R.E.S., The United Africa Co.
Ltd., Akuse, Gold Coast.

I sent Mr Hy. J. Turner some notes on *Charaxes*, but I plead guilty of making a bad mistake—of course I have not got *Ch. jasius* here—some variations of *Ch. epijasius* confused me. However, when Messrs Watkins and Doncaster obtained for me Seitz' Palaearctic butterflies, which made my series complete, I felt embarrassed.

Before I add to the notes on Togoland *Papilionidae*, etc., I must mention something which I think is amusing. An R.C. Father, a Dutchman, who volunteered to work with U.S. forward troops when Holland was being liberated, and is a very keen entomologist stationed in Togoland, was rather envious when I told him I had captured *Papilio antimachus* in Belgian Congo, and before he left my bungalow on a hundred mile trip back to his mission on a motor cycle, vowed *P. antimachus* was as good as captured should he find one.

I have not seen one in Togoland. On his return journey apart from concentrating on riding on a bad bush road, and using the extra eyes entomologists are fitted with, saw a magnificent specimen of *P. antimachus* sitting by the side of the road very close.

After a combined operation worthy of F.-M. Montgomery, he dismounted smartly, seized his net and the butterfly had gone.

Then he was tempted to climb another 1500 foot to the top of Amedzofe mountain, the highest point in Togoland under U.K. Trusteeship. At the very top there is a cross of iron, erected by Germans years ago. He knew this was a favourite haunt of *Charaxes*—for some reason they loved the highest point of mountains (as well as the plains proper) flying around the Cross were many *Charaxes lactitinctus*—a splendid insect! These perched on the cross, perched on his helmet, perched on the top of his net, explored his face, and perched on his clothes—they were all

very inquisitive. When it came to trying to net one, it was a different story. There seemed to be combined operations, and in the end when he had to leave he had one damaged one—and the others chased him away when he mounted his motor cycle. Even *Charaxes lactitinctus* cannot get away with that! I might add they were not interested in rotten fruit-mangoes, or a tin of stuff from a helpful dog, but plans are being laid.

In Seitz, comparing the habits of *Agrias* and *Charaxes*, volume of American Rhopalocera, it is stated that *Charaxes* never settle on leaves of trees with their wings outspread—the Togoland *Charaxes* evidently do not know the rules—both *Ch. zinga* and *Ch. cynthia* indulge in this, and of course have a fatal habit of returning to the same place like *Agrias*. This refers to males only, to get the rare females means making excursions into thick bush and to certain favoured trees.

Although I have got many *Charaxes*, this R.C. Father has been lucky with both males and females of *Ch. boueti*. However, he was very glad to get males and females of *Ch. imperialis* from me, and very envious to get my female forms of *Ch. etheocles*—which mimic all kinds of females of other *Charaxes*.

At the Natural History Museum, Mr Gabriel kindly showed me a specimen of *Papilio zalmoxis* labelled “from Togoland”; although I got this in Belgian Congo up the Kuilu River, I have never seen it in Togoland, or Gold Coast.

I showed Mr Gabriel a specimen I had obtained on the Volta River of *Papilio demodocus* (so similar to *P. demoleus* familiar to collectors in India, etc.) my find was *P. demodocus*, ab. *carye*. In the Museum were two only from Ivory Coast. On the 8th and 9th of May this year I obtained four more—each varying from all black except the yellow transverse band, to one more like the usual *P. demodocus* except much darker plus the distinctive enlarged giant yellow marking in the cell of the forewing. Mr Gabriel suggested this aberration was trying to “start up,” but it has not been very successful—because my African collector has haunted the only place where these have been found, and has seen no more. Neither have I—these specimens were found flying round the very brilliant blossoms of the red “Flame of the Forest” tree, with a few *P. demodocus* it is true, but the many hundreds of *P. demodocus* were drinking at Bourganvillea, and similar flowering shrubs.

These must be as elusive as *Pyrameis cardui*, the “Painted Lady,” which only appears here some years for a day or two and then is gone.

Rains were late this year, and butterflies scarce until May, when there were swarms of all the beautiful *Eronia* forms of *Argia*, and *thalassina* (many ab. *verulana* females—as well as the usual female form). To see these flowering shrubs covered with *Eronias*, *Papilios phorcas*, *demodocus*, etc., is a wonderful sight. Two weeks later, and only the odd one!

Papilio dardanus is as we all know a fascinating butterfly—the usual females—form *hippocoon* are fairly common, these vary a lot. I have two with extended white on the forewings, and yellow hindwings (like *P. thalassina*, ab. *verulana*, or female of *P. theora*, etc.) and one with practically white forewings—almost complete lack of black markings. Have found this with female *Euxanthe eurinome*, “albinism,” and the R.C. Father has a *Hypolimnas dinarcha* the same.

(To be concluded.)

COLLECTING NOTES.

DRURY.—In the March issue of the *Entomologist's Record*, in "Current Notes" you ask what became of the collection of Drury.

In the *Edinburgh Encyclopedia*, p. 66 (1815), Dr Leach says of the collection "That it was one of the most extensive ever made and is said to have contained, in species and varieties, no less than 11,000 insects."

His Museum of Entomology was disposed of in London by public auction and produced about £600.

One insect, viz. *Scarabaeus goliathus*, was purchased by Mr Donovan for 12½ guineas, who obtained also all the British Insects (which were very numerous).

Presumably Donovan incorporated these insects in his own collection.

Drury was well known to Sir Joseph Banks, and I feel that it is probable that part of Drury's collection may have been acquired by him, in which case I believe it will be found in the British Museum.

I have the following references, which I have not seen except the first to Drury.

Griffin, F. J. (1942). "Henry Smeathman." *Proc. R. Ent. Soc. London*. (A). 17. 1-9.

Cockerell, T. D. A. (1922). "Dru Drury an 18th Century Entomologist." *Scientific Monthly*. 17. 67-82.

Griffin, F. J. (1940). *Proc. R. Ent. Soc. London*. (A). 15. 51.—
BRIAN O. C. GARDINER, 34a Storeys Way, Cambridge, 10.4.49.

C. LIVORNICA AT BRAUNTON, N. DEVON.—On 2nd September, at 11.45 p.m. (B.S.T.) a *C. livornica*, Esp., came to an electric light on the loggia here and was netted with difficulty. It proved to be a large female in very good condition.—E. BARTON WHITE, F.R.E.S., Braunton, N. Devon.

LARVAE OF *H. PINASTRI*, LINN.—Larvae of *H. pinastri*, Linn., from Bournemouth ova laid in the Spring of 1948 fed up and pupated normally. The pupae were undisturbed until 25th May 1949, when they were placed in moist loose peat mould in a flower pot in the greenhouse. Though alive and active, none has emerged to date—10th September 1949.—E. BARTON WHITE, Braunton, N. Devon.

LARVAE OF *B. NUBECULOSA*, ESP.—Larvae of *B. nubeculosa*, Esp., from Scottish ova laid on Birch twigs, were, when one-third of an inch in length, placed in perforated zinc cylinders inserted in flower pots. They fed up rather unevenly, but, with one fatality, pupated normally during July 1949.—E. BARTON WHITE, Braunton, N. Devon.

CURRENT NOTES.

WE have just learned that the International Congress of Entomology will be held in Amsterdam, 17th-21st August 1951.

WE are pleased to state that the admirable *Dover List of Lepidoptera* can be obtained from the Buckland Press, Dover, Kent, at the price of 5/6, post free.

WE understand that that excellent journal for Lepidopterists, *La Revue Mensuelle de Lépidoptères*, successor to *L'Amateur de Papillons*, is about to reappear under the direction of Monsieur Le Charles, a colleague of the late editor, Monsieur Leon Lhomme.

We would suggest that all interested in receiving this magazine should write M. Le Charles, 22 Avenue des Gobelins, Paris, Venne., to ensure that their names are on the subscribers' list, and we need hardly add that new subscribers would be welcome.

Now that Continental travel is open to so many, we feel sure that lepidopterists visiting the Continent will find one of their wants filled by this magazine, and another want will be satisfied by the splendid catalogue on which Monsieur Lhomme worked for so many years, and which, it is hoped, will be completed under the direction of his colleagues in due season as a fitting memorial to this man, who was not only a very sound lepidopterist, but also a delightful companion and correspondent. So far, the Macro-Lepidoptera portions are complete, as also are the "Pyrales," "Plumes," and "Tortrices," while the "Tineina" have appeared as far as *Depressaria*. The whole manuscript is complete and only awaits the funds for publication, which takes place whenever possible. It would be the greatest of pities were this work to fail through lack of support, for it is of great value to those whose interest is limited to British Lepidoptera as well as to those with a wider outlook. M. Le Charles will doubtless be in a position to give details of cost to all who are interested, and we may add that we have found this very moderate in the past.—S. N. A. J., 20.ix.49.

CORRECTION.

Ent. Record, p. 94, Sept. No. Mr Sperring states that the species which he referred to was *Lucania favicolor*, and not *suasa*.

REVIEW.

DIPTERA. Introduction, and Keys to Families, by H. Oldroyd, being Part 1 of Volume IX of the Handbooks for the identification of British Insects, published by the Royal Entomological Society of London. Price Seven Shillings and Sixpence.

This is the first part to be published on the Diptera in connection with a very desirable, if somewhat ambitious, scheme for the production of a series of Handbooks on British Insects. Conciseness and cheapness are stated to be the main objectives, and this part of only 49 pages, one coloured plate, and 97 text figures, which includes not only explanations and illustrations of most of the technical terms used in Dipterology, but also indicates the main lines of classification, as well as variations in structure, in the Order, and provides a Key to all the Families, can rightly claim to have attained at least the first of these objectives.

The figures on the coloured plate (of a Blow-fly and a Bot-fly) are copies of two of Mr A. J. E. Terzi's well-known masterpieces, but these and the twelve other black-and-white figures of complete insects, all lack one important detail, viz., an indication of the natural size of each. A beginner studying this part is left with the false impression that the Hippoboscid *Stenopteryx hirundinis*, L., is far and away the largest insect of those figured.

The introductory portion of 36 pages gives practically all the information a beginner need know about the morphology of the Diptera in order to use the Table of Families, and should prove of considerable value, a value in no way diminished by the fact that it is open to a certain amount of criticism.

In fig. 8 the front part of the frons of one of the Clusiidae is incorrectly called the "median frontal plate," such a sclerite *is not present* in the Clusiidae, the term is sometimes used for the "interfrontalia," forming a chitinized projection forwards of the ocellar triangle, in fact the "much enlarged frontal triangle" of fig. 9 is actually the much developed interfrontalia, and examples of less developed ones are often found in the Tetracerae, as well as elsewhere.

In fig. 26 the sutural depression causing a definition of the post-alar callus, though mentioned in the Table of Families, is not indicated.

In fig. 33 mention might have been made of the "stigmatal bristles" as distinct from the "propleural bristles," and of the "metasternum" lying between Cx2 and Cx3, all of which are indicated in the figure.

In Table 1 on page 21 the abbreviation "im" for a crossvein should be replaced by "m" or "m-m," further it is the base of M4 (*not* M3) which represents the "lower (small)" crossvein of both Verrall and Comstock-Needham.

The figures of "breaks" in the wing costa will be referred to later, but fig. 73 gives the false impression that the mediastinal (or SC) vein is absent.

On page 25 the emended spelling of *Gastrophilus* is used, though the original spelling of *Gasterophilus* is employed elsewhere.

In the "List of Families" on page 35, an "i" should replace "z" in Chiromyzidae, and "Asteidae" should read either Asteiidae or the possibly more correct Astiidae. The order of families in the Acalypterae is very far from being a natural arrangement.

Finally the fact has been overlooked that the true position of the Phoridae (as near the Platypezidae) was established by the discovery of the Sciadoceridae.

The compilation of this introductory portion must have resolved itself mainly into deciding what might safely be omitted for the sake of brevity, but the production of a satisfactory Key to Families was inevitably a much more difficult matter, because no really satisfactory Key has yet been compiled. No one, for instance, who has worked at the Acalypterae could fail to realize the difficulties of adapting to the requirements of British Dipterists these previous attempts at the production of a Key, which is what Mr Oldroyd has attempted. He was warned that previous Tables in which use was made of the costal "breaks" were probably unworkable, but he has endeavoured to get

over the difficulty by extending the repetition of doubtful cases under both headings, and by giving figures of some of them. It is certain that he might have carried these processes further with advantage. Further, whereas Hendel, who first made use of these costal break characters, appears to have adopted the point of contact of the *upper margin* of R1 with the costa, as the point where that vein joins the costa, Mr Oldroyd has adopted the point of contact of the *lower margin* of R1 with the costa (v. arrow-heads in figs. 71 and 72), without making corresponding alterations in the position of families in the Key. Moreover, his figures 71 and 72 are not absolutely accurate in their representation of vein R1, or in details of costal chaetotaxy. There are usually some faint indications of a continuation of vein R1 in *normal width* along the underside of its apparently thickened part, and though there may be an indistinctness of the upper margin of this vein immediately beyond the junction of vein SC with costa, this is due to the presence of the fold in the wing shown in fig. 73. This fold is *not* distinctive of the Psilidae as stated in couplet 65 of the Key (where "discal cell (1st M2)" should read "second basal cell (M)"), but is more or less distinctly indicated in a large number of the Cyclorrhapha, occasionally even simulating a cross-vein between R1 and costa, in other cases an apparent fusion of the two. This constitutes one of the reasons why the character of the position of the costal break in relation to the end of vein R1 is so difficult of application, a difficulty not overcome by Mr Oldroyd's adoption of another point of junction of R1 with costa because these veins often merge so very gradually into one another. Anyone in any doubt about the correctness of his own interpretation of these costal break characters when using the Key, should invariably try the alternative division.

It may be useful to indicate one or two mistakes which have crept into the Key, and call attention to some statements which should not be taken too literally.

Couplet 14, first line, for (fig. 1) 5 read (fig. 15).

Couplet 16, after "Dolichopodidae" add "and Empididae."

Couplet 18. A few Tabanidae have unicolorous eyes, and some Stratiomyidae have banded eyes. In the latter family *Xylomyia* is an exception in regard to spurs to the tibiae; also "tip" of wing is presumably a lapsus for "margin."

Couplet 28. The "s" should be struck out of "cells." The proboscis of Dolichopodidae is certainly not always "soft and fleshy."

Couplet 29. There are exceptions in the case of all the distinctions given for the Syrphidae except that of the closed first posterior cell.

Couplet 30. The head of no Pipunculid is actually "spherical" in profile, and some are no more than hemispherical.

Couplet 33. See earlier note of the fact that fig. 27 does not show the sutural depression mentioned in the couplet.

Couplet 35. "SC" should be inserted between the words "at" and "or," and "vien" should read "vein."

Couplet 55. The second character given for the Clusiidae is *not* a family distinction.

Couplet 58. For "face" towards end of first line read "frons."

Couplet 60. Figs. 72 and 76 represent part of the wings, not the palpi, and these latter while shorter and broader in Chironomyiidae are scarcely "abbreviated."

Couplet 61. The frons of Chloropidae does occasionally (e.g. *Diplo-toxa*) bear conspicuous bristles.

Couplet 63. Instead of "first antennal segment (scape) conical" read "first segment of ovipositor large and conical," and in place of the last character for Anthomyzidae read "Female with normal inconspicuous ovipositor."

Couplet 64. The record of the genus *Selachops* as British was based upon a misidentification (v. *Ent. Mon. Mag.*, 1911, 254).

Couplet 65. The reference under Psilidae to the "discal cell (1st M2)" is a mistake for "second basal cell (M)," and the statement that the r-m crossvein is "very near" the second basal and anal cells is somewhat misleading.

Couplet 68. Instead of "eyes" at end of first line in second paragraph read "frons."

Couplet 72. See note under couplet 61.

Couplet 78. There are some species in the Phasiinae of the Tachinidae, and the Rhinophorinae of the Calliphoridae which cannot be satisfactorily placed by the single character adopted in the Key.

It should be remembered that it is not easy for anyone capable of "placing" a British species in its correct family or genus, without reference to any Key, to recognize and meet the difficulties experienced by a beginner when using one, so that such people when drafting Keys work at a disadvantage. Probably really satisfactory Keys to the Families and genera of British Diptera (or any other Order) could be more quickly produced if all beginners would make public the difficulties they experience in working with existing Keys.

To those commencing the study of the Diptera this part is the most important one of the series, and we have no doubt the demand for it will be great.

J. E. C.

EXCHANGES.

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Royal Entomological Society of London, 41 Queen's Gate, S.W.7: November 2nd, December 7th, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1: Saturday, October 29th (Annual Exhibition): open from 11 a.m. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*. Monthly Meetings are held at Museum and Art Gallery. Particulars from Hon. Secretary, H. E. Hammond, F.R.E.S., 16 Elton Grove, Acocks Green, Birmingham.

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Communications received:—Thomas Greer, Fergus J. O'Rourke, O. Querel, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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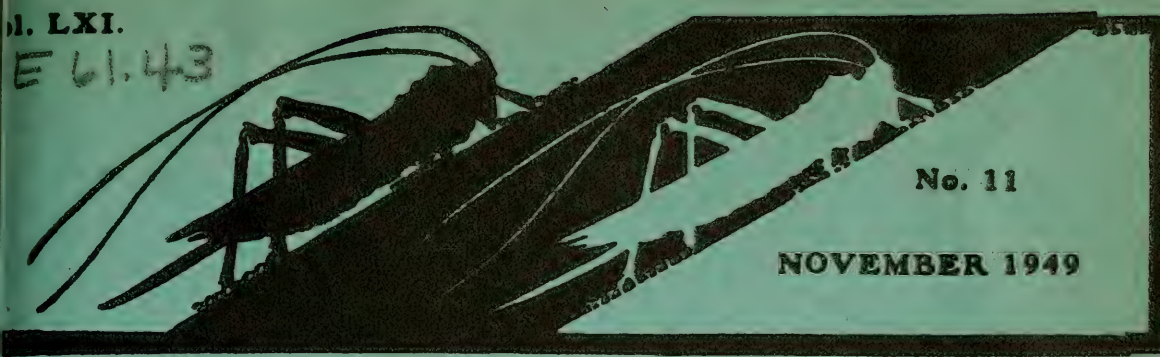
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By T. D. FEARNEHOUGH.

When on September 4th of this year Mr O. G. Watkins captured a female Queen of Spain Fritillary at Plymouth, he very bravely refrained from setting a good insect and kept it alive, hoping for ova. He got eggs all right, and will, no doubt, tell his story of them, and relate his own rearing experience in due course.

A dozen of the ova were sent to me, and when the package arrived it was found that eight eggs had hatched during the journey. Three more hatched the following day, but the twelfth egg proved infertile. The lathonia larva on hatching makes a meal of the empty shell, leaving only that part of the base glued to the leaf. Since the normal food-plant, Heartsease (*Viola tricolor*), is a rarity in my immediate neighbourhood, the larvae were offered flowers and leaves of garden violas. They ignored the petals but tackled the leaves with enthusiasm, eating out scallops from the leaves edges.

At this time the weather was hot and sunny, and the glass-topped tins in which the larvae were contained were kept in an attic where the temperature rose to 90°F. on several successive days. According to text books, *lathonia* is double brooded, the larvae from the second brood hibernating at an early stage. My main concern, therefore, was to force the larvae past any hibernation stage, and to this end they were given artificial warmth at night. They grew remarkably rapidly and moulted three times in as many days. The weather then turned cooler, so artificial warmth was given day and night. A max./min. thermometer, kept adjacent to the larvae tins during the whole period registered highest and lowest temperature of 92°F. and 75°F. respectively. The larvae were entering their fifth and final instar in five to six days after hatching.

Lathonia caterpillars have been well described several times, and they are, indeed, attractive creatures. They fed in short bursts at terrific speed, and after each spasm of eating retired to the walls of their container and remained motionless for considerable intervals, usually taking up vertical positions. The larvae, when young, hunted over the leaves supplied and chose the tenderest one on which to feed. After each rest they returned to their chosen leaves and often resumed feeding just where they left off. It was amusing to see several larvae tearing away at one leaf whilst other adjacent leaves were left untouched. As the caterpillars became larger they were less critical of their food and often attacked juicy stalks of untouched leaves. They had a habit in all stages of seizing in their jaws pellets of frass and hurling them away with a toss of the head.

When full fed the larvae ran about their containers spinning large amounts of silk in a most haphazard manner. The glass top and sides of one container were covered with silk by three larvae. Finally, they settled down and, having spun small pads, hung by the rear claspers in the manner of their tribe. The first larva pupated at 3 p.m. on October 1st, having taken but seven days from hatching to pupation. I was lucky enough to observe the happening. About one hour before pupation the white band, with which the pupa is adorned, becomes

visible through the larval skin and, taking advantage of this indication, I was able to witness four other larvae make the change.

It was at pupation that first losses occurred. Five of the larvae failed to pass this trial, and ruptured themselves at the wing cases or thorax. The other six larvae formed apparently healthy pupae, but one of these died later. The pupa of *lathonia* is beautiful, being at first dark brown with a white band across the back and merging on the wing cases, but it soon becomes paler and very shiny all over. A double row of metallic spots glistens along the back.

On October 4th one of the pupae coloured up, and after I had been watching it continuously for an hour and a half, the great moment arrived at 9.25 p.m. I saw a fine male struggle from its pupal case and quickly unfold its wings. This specimen had thus taken only ten days to mature from hatching. The others were not far behind, and a second specimen, a female, emerged on October 5th at 9.0 p.m. The following day brought the emergences of a male at 7.10 a.m., and two females at about noon.

The five specimens were of normal size and showed considerable variation in markings. One of the males had the black markings generally enlarged, the three spots at the base of the forewings being large enough to touch one another. In contrast a female was but lightly marked with a paler ground.

POLYOMMALUS (LYSANDRA) CORIDON ABERRATIONS.

By CHAS. B. ANTRAM.

I and two others had ten days collecting at Worth Matravers, Dorset, specially for aberrational forms of the Chalk Hill Blue this year but we were too late for the first emergence of the butterfly. In these difficult times one has to fix up accommodation months ahead specially in the August Bank Holiday, and not being able to forecast weather conditions for the first week in August, which is about the usual time for appearance of this insect, we found we were nearly three weeks late to catch them just out. We put up at a farm from the 30th July until the 8th August, and by that time found many of the specimens badly worn and tattered. However, we did quite well and obtained a nice lot of rare and minor vars. in perfect condition. On the first day we got a very perfect *fowleri* male, and before the end of our trip three more, one being a female. Our best catch perhaps was a female combining several forms. On the upperside *atrescens*—*fuscofimbriata*—*mixtacae-rucinta*—*postradiosa*; the underside having a large white patch nearly covering the whole of one hindwing. In addition to its being a very black *atrescens*, the hind wings have well marked white border circles standing out most vividly on the black background making it also *cincta* and further to this the hindwing, bearing on the underside the bleached patch, has on the upperside a broad pale greyish-blue streak filling the interspace along the inner border. A most beautiful and perhaps unique specimen.

Of races, besides the four *fowleri* we took:—

| | |
|----------------------|-------------------|
| Many obsoleta. | 1 subelongata. |
| 10 postcaeca. | 2 antistriata. |
| 4 partimtransformis. | 3 glomerata. |
| 3 atrescens. | 1 tri-I-nigrum |
| 1 postimpar. | 1 sessilis. |
| 1 flavescens. | 3 triswavis. |
| 2 albomaculae. | 3 fuscofimbriata. |
| 1 retrojuncta. | 1 infralavindula. |
| | 3 pulla. |

And of uncommons or scarce (several of each):—*basijuncta*, *costajuncta*, *discreta*, *crassipuncta*, *addenda*, *arcuata*, *nigrescens*, *lunaextensa*, *major*, *fuscamargo*, *parvipuncta*, *antipluripuncta*, *albonogrofimbriata*, *alternafimbriata*, etc.

I have not given a list of the commoner vars., as being so numerous are of little interest. The commonest were of the *punctata*-*marginata* forms and some of the slightly better *ultrapunctata*-*marginata* closely approaching *fowleri*.

The scarcity of radio forms was very noticeable this year, but I do not know if this is the case every year in this particular locality. It is well known that Dorset does not produce the *syngrapha* forms.

“Clay Copse,” Sway,

Lymington, Hants., 23rd October 1949.

[Each of the above Latin descriptive terms stands for a single character only; it is from these that combines are used to describe species, forms, races and aberrations are described.—H. J. T.]

NOTE ON THE BUTTERFLIES OF THE NEW FOREST IN 1949.

By CHAS. B. ANBRAM.

One would have supposed the past wonderful Summer with its long dry spells would have been most favourable to all varieties of our common butterflies but it is hard to recall any year when there have been so few on view. On the contrary, with some exceptions, of course, this has not been the case; the long droughts were too much and must have dried up not only chrysalids but food-plants, and it was noticed that there have been a large number of dwarfed specimens, resultant probably of unsucculent and poor feeding. In this area of the New Forest, at all events, very few, indeed, have been seen of such species as the small tortoiseshell, peacock, red admiral, comma, whites, etc. The painted lady is the exception, as a great many have been about in September and October. The commonest butterfly in those months has been the clouded yellow with a very high proportion of the *helice* forms of the female. Although throughout the year, they were somewhat thinly distributed in all districts, a large brood appeared in late September and October without, however, making a “Clouded Yellow year” as in 1947. If I had wanted them, I could have taken a very large number of *helice*, and saw one or two as recently as the 21st October.

Locally, there were very few of the fritillaries with the exception of *euphrosyne*, very few indeed of the white admiral and other common species usually found in the New Forest. The brimstone, orange tip, meadow brown, grayling, ringlet, etc., were in fair number, but perhaps not so many as usual. The purple hairstreak was in its usual abundance while the brown hairstreak in its few well known localities was very scarce. *Icarus*, *phlaeas*, *minimus* and *argus* have not been really common but *aegon* very plentiful on all the heaths here.

Mel. cinxia appeared in plenty in the Sway locality and as previously recorded is extending its area most satisfactorily.

Going over into Dorset, at Worth Matravers the long dry summer made no difference to the prevalence of the Chalk hill blue and the marbled white, both of which were swarming. Weather conditions, however, had brought them out more than a fortnight earlier than their usual time to appear, and there were a large number of badly worn specimens of the chalk hill blue by the 1st of August. However, fresh emergences of this continued until the last days of August.

“Clay Copse,” Sway,
nr. Lyminster, Hants., 23rd October 1949.

MORE VALUABLE RECORDS.

By J. W. HESLOP HARRISON,
King's College, University of Durham, Newcastle-upon-Tyne.

ASPEN INSECTS IN GLEN SHELLESDER, ISLE OF RHUM.—Although the usual foodplants of *Notodonta ziczac* in the Hebrides are *Salix atrocinerea* and *S. aurita*, the insect is not uncommon on aspen in the Isle of Raasay. This season, as I was leaving the main colony of *Entephria flavocinctata* on Rhum, I followed the Shellesder Burn down the slopes of Fionchra and was surprised to find a small isolated colony of well-grown aspens in a tiny ravine. These supported colonies of larvae of *Laothoe populi*, *Cerura vinula* and *Notodonta ziczac*.

RHODITES ROSARUM, GIR., ON A HYBRID ROSE.—In view of the fact that members of the Cynipid genus *Rhodites* generally adhere to one species of rose in any particular colony, it seems worthy of record that on a pit heap at Birtley, Co. Durham, where the chosen substitute is *Rosa mollis*, the galls of *Rhodites rosarum* abounded this year on a rose of parentage *Rosa rubiginosa* × *R. spinosissima*.

TETHEA OR, FAB., IN THE ISLES OF LEWIS AND HARRIS.—This season *T. or* swarmed as larvae on cliffs in the Meodale ravine, S. Harris, to such an extent that the aspens looked black owing to the spun leaves of the larval shelters. Not all of these contained living larvae, for many of the latter had been drowned by casual rain showers in early August. The same insect was common on aspen at an elevation of 700 feet on Bulavel, S. Harris, as well as on Ben Bragor, Lewis. The moth was also plentiful on aspen at Dalemor and Carloway on sea and other cliffs.

THE GALL-GNAT *PERRISIA ULMARIAE*, BREM., IN THE OUTER HEBRIDES.—This gnat, although the commonest of those attached to meadow-sweet on the mainland of Great Britain, is unaccountably rare both in the Inner and Outer Hebrides, its place being taken by *Perrisia pustulans*. In August, however, a strong colony was discovered on the west side of S. Harris at the mouth of Glen Seilebost.

BOMBUS SMITHIANUS, WHITE, ON THE ISLE OF STROMAY.—This season we explored Stromay, one of the smaller islands lying in the Sound of Harris between the Isles of Harris and North Uist. Careful search for bees revealed the presence of this species only, two queens being observed. Of these, one was noted probing flowers whilst the second was picked up dead.

LARVAE OF *NYSSIA ZONARIA*, SCHIFF, BEATEN WITH THE PSYLLID *APHALARA NERVOSA*, FORST., OUT OF YARROW ON THE ISLES OF BENBECULA AND LEWIS.—In June and early July, advantage was taken of the visits to these two islands to determine the extent covered by the colonies of the newly-detected Hebridean race of *Aphalara nervosa*. Almost immediately the yarrow on the dunes at Balevanich, Benbecula, was beaten the desired insect was obtained in company with larvae of *Nyssia zonaria*. A few days later, when we proceeded to Barvas on Lewis, the same pair of insects was beaten from yarrow along a path side fully a mile inland.

EUURA ATRA, JUR., ON *SALIX AURITA* AT DALEMORE, ISLE OF LEWIS.—This gall-making sawfly, although now known to be widely distributed in the Hebrides, has not previously been recorded from Lewis. It is now reported from *Salix aurita* growing at Dalemore, Lewis.

PIERIS BRASSICAE AT THE FLOWERS OF THE ORCHID *ORCHIS FUCHSII*.—Considering the abundance of the spotted orchid in some of its colonies, it is very remarkable that insect visitors are very rarely seen at its flowers. In particular, it seems almost wholly neglected by butterflies. However, on 9th July I observed a Large White probing its flowers in a clay pit at Birtley, Co. Durham.

**BLASTOBASIS PHYCIDELLA, ZELLER (1839) (LEP.,
BLASTOBASIDAE): A SPECIES HITHERTO UNRECORDED FROM
BRITAIN.**

By S. N. A. JACOBS.

Having acquired the Microlepidoptera portion of the collection of our late colleague, W. Fassnidge, my attention naturally turned towards the "treasures," and one of the first things I examined was his series of three specimens of *Auximobasis normalis*, Meyr. These specimens are labelled from Southampton and dated 7.iv.30, 14.iv.30, and 1.v.30. Fassnidge had told me that he found these three specimens, together with a fourth which he had presented to the Natural History Museum, on the outside of a warehouse in Southampton Docks, and he had sent them to the late Edward Meyrick for determination.

I was at once struck by the similarity of wing-pattern between these three insects and a series of four insects dated from various localities in South France, and bearing Lhomme's MS. label "*Blastobasis phycidella*," situated in the same drawer. I at once called the attention of Mr Bradley of the B.M. to this and he has kindly gone to considerable trouble to investigate the matter, and has proved beyond doubt that the British specimens are *Blastobasis phycidella*, Zell.

How the mistake occurred is difficult to say; the insects have been compared with Meyrick's very fair series of *Auximobasis normalis*, and there is no superficial resemblance whatever between them.

Meyrick's record in his Revised Handbook of Brit. Lep. is of a single specimen from Liverpool Docks, and it would be interesting to know whether this specimen is still in existence; it was recorded as taken in 1921.

About a year ago, I was taking advantage of Fassnidge's hospitality and kindness, to make a figure of "*A. normalis*" from one of his specimens, and as my attention was fixed on the one specimen I was drawing, I did not then notice its neighbours in the drawer. This drawing is to appear in the *Trans. South Lond. Ent. and N.H. Soc.* for 1948-49, and it is indeed fortunate that this mistake has been discovered before publication of the paper, which includes British *Blastobasidae* and *Auximobasidae*. The necessary correction has of course been made.

B. phycidella, Zell., is distributed over Central and South Europe to Asia Minor: Lhomme (*Cat. Microlep. Fce. and Belg.*, No. 3215) states: "The biology of the larva is still unknown but it has been found in some numbers in dried fungus in a forest (Schütze) from Autumn to Spring, being found in winter on the bark of trees, in the hollows of galls on peach trees, acorns of *Quercus ilex*, L., etc." He gives records from Ostend and Saint-Idesbald in Belgium, the former record being in keeping with the occurrence of the insect in this country. The mention of dried fungus brings to my mind the possibility that it may have been imported with ergot of rye from Portugal or other Southern European place, which commodity I have known to be heavily infested by *Tinea granella*, L., and by *Stegobium panacaeum*.

54 Hayes Lane, Bromley, Kent, 5.ix.49.

**THE MALE OF SYNTORMON MACULA, PAR.
(DIPT., DOLICHOPODIDAE) FROM BLAIZE WOODS, NEAR
BRISTOL.**

By E. C. M. D'ASSIS-FONSECA.

A single male specimen of *Syntormon macula*, Par., was obtained on 1st August this year (1949) by sweeping ivy growing on the banks of a dried-up stream in Blaize Woods, near Bristol (Glos.). As this is the first *male* of the species ever to be recorded, further specimens for distribution to other dipterists would have been of value and considerable efforts were made between 1st August and 21st to find more of them, unfortunately without success.

This solitary specimen, which, to judge from the contraction which has taken place in drying, was rather immature, was examined in detail

and fully described a few minutes after killing. It is, of course, realised that the description of a species made from an immature specimen may require some adjustment when a mature specimen is available for examination, and the description given below is published with this possibility in view.

♂. Frons and face with greenish ground covered by whitish pruinosity, thinly on frons, thickly on face. Face, immediately under antennae, nearly as broad as third antennal segment, narrowing sharply at first, then more gradually to the clypeus, where it is about two-thirds the width of the front meta-tarsus. Postocular ciliation, lateral and lower, white. Antennae entirely black, slightly longer than the head, basal segment with a dorsal seta, apical segment about two-and-a-half times as long as broad, with fairly long pale pubescence. Arista sub-apical, very slightly shorter than third antennal segment. Dorsum and scutellum coppery-green, the colour partially hidden by whitish pruinosity, more coppery-red along the lines of d.c. bristles. Acrostichal bristles uniserial, short but fairly strong. Six d.c. bristles, with a black spot at the base of each. Pleura coppery-green with thick whitish pruinosity, unicolorous right up to the hind-margins. One pair of strong scutellar bristles. Abdomen mainly transparent yellow, the coppery-green colour covering the first tergite entirely, forming a somewhat faint, narrow triangular patch on the second tergite, a rather broader triangular patch on the third tergite, and covering the greater part of the dorsal surface of the remaining tergites. Whitish pruinosity on abdomen very thin, hairs and setae black. Hypopygium darker yellow, with a shining black apex. Fore-coxae entirely pale yellow, with short pale hairs, apical bristles black. Mid- and hind-coxae black, yellowish at extreme apex, thinly whitish pruinose, with a strong black bristle on each, that on the mid-coxae lying towards the front, directed downwards, and with a row of 2 or 3 short fine black setae above it. Legs pale yellow, an indefinite dark ring at apex of hind-femora, all tarsi brownish. Fore-tibiae with a short dorsal bristle at middle; fore-tarsi simple, segments of normal length. Mid-femora with one each anterior and posterior pre-apical bristle, a fine ventral bristle a little before the middle and between this bristle and the base of femur a row of short black ventral setae which are much shorter than the femur is thick; mid-tibiae with one postero-dorsal bristle at basal quarter and 3 antero-dorsal bristles. Hind-femora with one pre-apical bristle on anterior face only; hind-tibiae with 3 antero-dorsal, 4 postero-dorsal bristles, and a double line of short ventral setae; hind-tarsi simple, meta-tarsus about the same length as the next segment. Wings hyaline, with a faint brownish spot about one-third of the way along the apical section of V.4. V.3 somewhat arched forward at middle and very slightly divergent from V.4 at apex. Basal and apical sections of V.4 equal. Hinder cross-vein straight, at right-angles to V.4, shorter than apical section of V.5. Halteres pale yellow, squamae yellow, with a narrow black edge and black fringe. Length 3.25 mm.

I wish to express my thanks to Mr J. E. Collin for kindly examining the specimen and for his valuable advice and help in the preparation of this note.

18 Grange Park, Henleaze, Bristol.

8th September 1949.

COLLECTING NOTES.

EARLY APPEARANCE OF SATYRUS GALATHEA IN SOMERSET.—I captured, in fresh condition, a male *S. galathea* at a locality seven miles distant from Wells, Somerset, on 11th June. I cannot remember ever having seen this species so early on the wing. Males were common by 26th June and females by 2nd July this year in this district.—NIGEL T. EASTON, Milton Lodge School, Wells, Somerset, 22nd September 1949.

IMMIGRANTS IN SOMERSET.—These have been plentiful this year on the whole, though there have been a few absentees. I cull the following from my diary:—

Vanessa cardui.

Several were on the move and flying in a Northerly direction at an altitude of 1000 ft. on the Mendips near Wells on 17th April. This is my earliest record of this species, which has appeared in fair numbers—there is a fresh emergence as I write this letter—throughout the Summer. A worn specimen was noted on 11th June and this may have been an immigrant.

Colias croceus.

I can never remember a year in which this species was so abundant. I received an unconfirmed report that two males had been seen in a garden in Shepton Mallet on 31st March. Fresh males, presumably from the Spring immigrants, appeared on 11th June, a freshly-emerged female was taken on 12th June, and the species was in evidence sparingly and fairly continuously from that date until 26th July, when a new hatch appeared, reaching a climax on 29th July, on which day I must have caught and examined between 70 and 100 freshly-emerged specimens, mostly males. *Ab. helice* appeared on this date and, of the females subsequently examined, a very high proportion were of this form. This approached between 30% and 50% of the females seen and examined.

Emergence has been continuous and, whenever the weather has been suitable, *C. croceus* could always be seen, some fresh and some worn, the broods being "staggered." In this respect, emergence has differed from 1947, when the several broods were "cut and dried," so to speak, and did not overlap to any extent. The numbers, which have been steadily increasing since 9th September, suffered a serious setback on 21st September, when heavy rain fell and a decided drop in temperature took place. It is to be hoped that this change will not result in the annihilation of what promises to be a record year for this species.

Macroglossum stellatarum.

This species has, this year, been commoner than I can ever remember. I noticed it, freshly emerged, in the garden on 8th August, since when I have recorded its presence on every single day, sunny or cloudy, feeding at tubular flowers in the garden, reaching a peak during the first week in September, when it was no exaggeration to say that it was our commonest moth. It was in splendid condition and when not feeding on the wing it delighted to bask in the sun in our walled garden.

Plusia gamma.

P. gamma has been common throughout August and is now (22nd September) reaching a peak of abundance.

Rhodometra sacraria.

A fresh male was found at rest low down in a wheatfield at Wells on 12th September by my colleague, Mr J. Anthony Thompson, since which date he has noted two other ♂ examples, both worn, in the same locality.

I have not yet met with either *Colias hyale* or *C. lineata livornica* in this district.—*Id.*

PIERIS NAPI: AN UNUSUAL PAIRING.—I was surprised to see, in one of my large breeding cages, on 25th May, a white male *P. napi* of typical form "in cop." with a var. *hibernica*, Schmidt,, male. In spite of handling and subsequent killing in cyanide they remained so coupled.

They were successfully set, back to back, but I regret to say that I found it impossible to remove both insects from the setting-board without separation, owing to the brittleness of their bodies and the extreme difficulty of lifting them both at once.

I have bred many thousands of *Pieris napi* and, though I have several times observed one male trying to pair with another of the same sex, I have never before viewed the "fait accompli."—*Id.*

LIMENITIS CAMILLA IN SOMERSET.—On 13th July one of our boys reported having seen a White Admiral in our garden. As there are no woods of any size in the neighbourhood, and the boy is a beginner, this report was not taken seriously at the time. However, on 19th July, during a momentary lull in a cricket match, I had opportunity to verify his report, for within two yards of me I chanced to see a fine example of this handsome butterfly settled on a flower head. It appeared to be quite fresh.

One was seen by me near Street, Somerset, on 2nd July in a locality where there was little more than a copse.

I understand that this butterfly is not at all frequent in this part of the country, at least, and appears to eke out a precarious existence here in somewhat unsuitable surroundings.—*Id.*

ARGYNNIS PAPHIA VAR. VALEZINA, FROHAWK, IN SOMERSET.—A worn example of this butterfly was taken in this garden on 26th July by Mr J. Anthony Thompson. Owing to unsuitable conditions here even the type is scarce, so this capture is all the more remarkable.—*Id.*

ARGYNNIS SELENE: SECOND BROOD.—The abnormally fine summer has apparently produced a partial second brood of this species. In a quarry within a mile of Wells on 11th August I captured a rather worn undersized female.—*Id.*

DEILEPHILA LIVORNICA TAKEN AT SWANAGE.—Reference the record, in the September number of the Journal, of a single specimen of *Deilephila livornica* taken at Swanage on 15th August, it will be of great

interest to note that this good Hawk Moth must have been in large numbers ranging over the Southern counties of England during August last, as I am able to record the taking of as many as 52 specimens in the Bournemouth area alone.

These were taken with the net at dusk at the flowers of petunia and tobacco in private and public gardens by Entomologists of my acquaintance. In *The Field* of 24th September are also recorded the taking of single specimens of this insect in widely-separated districts, namely, Lannacombe in Devon to Godalming and Woking in Surrey.

As a large number of these 52 were absolutely perfect and apparently just emerged, it would be of interest if we can be sure these bred here. Being double brooded, visitants from the Continent in May have probably accounted for those taken in August here, being the offspring of the early immigrants. The food-plants being vine, fuchsia and dock, of which latter there is plenty and much fuchsia in gardens.—CHAS. B. ANTRAM, 1st October 1949.

COLIAS CROCEUS (EDUSA).—Throughout September and at the present time, early October, this insect has been in large numbers in the New Forest area, but nothing like so numerous as in the "Clouded Yellow" year of 1947.

However, just now it is very plentiful and the forms *helice* and *pallida* in good proportion.—C. B. ANTRAM, October 1949.

CLYTIOMYIA ROTUNDIVENTRIS, FALL. (DIPT. TACHINIDAE) AT BREAMORE, HANTS.—On 10th September this year I had the good fortune to catch a single male of this rare fly on wild parsnip in Kiln Wood, close by Breamore. Several subsequent visits failed to produce any more specimens.—H. W. ANDREWS, The Rookery, Breamore.

HOMOEOSIS IN *EPIRRHOE ALTERNATA*, MULLER.—On 31st May Mr A. L. Goodson took a female of *Epirrhoë alternata* near Brigstock, and as the form in this part of Northants is stated by Mr Alfred Hedges to be single brooded, I decided to test this. From the eggs obtained I bred 10 specimens as a second brood, but the weather was unusually hot and many single-brooded species produced abnormal second broods. Eighteen more emerged in 1948 between 1st May and 17th June, and amongst them one shows homoeosis. On the apex of the right hindwing the markings of the apex of the right forewing are reproduced on the upper side, and just anterior to the discal spot there is a black streak corresponding in length and position with part of the median band of the forewing. The under-side is normal and though a little altered in shape the wing is not reduced in size.—E. A. COCKAYNE, 8 High Street, Tring, Herts.

CURRENT NOTES.

WE find the following in the September issue of *The Mosquito*, which, in spite of its name, has nothing to do with Entomology. It is the organ of the Salonika Reunion Association and thus perpetuates the memory of the characteristic of Macedonia that left the most vivid memory upon those who took part in the campaign.

Under the heading of Identified, we read: "While gathering strawberries in the sand dunes at Porthcawl, Glam., on 18th July, Mr Percy House, a baker, captured a green locust. As he had served in Salonika in the 1914-1918 war, he recognised it at once. The police, who confirmed that it was a locust, informed the Ministry of Agriculture."

It is difficult to find the logic in the statement that the gentleman in question had served in the Salonika expedition, *ergo* he recognised the insect as a locust and it is surprising that the identification of Orthoptera is added to the existing burdens of the police force. True locusts occur from time to time in England and are duly recorded by the competent authority. One may hazard the guess that it was *Tettigonia viridissima*, L., which has already been recorded for Glamorgan-shire.—M. B.

CATOCALA FRAXINI COMMITS SUICIDE.—An odd incident happened on 3rd October on the Bosphorus, when my wife called my attention to a big moth sitting on the other side of a window pane in the waiting-room of the boat station at Kanlica on the Bosphorus. I saw that it was a Clifton Nonpareil and persuaded the ticket collector to let me outside on to the raft before the crowd broke. But my shadow fell upon it and disturbed it. It flew round, dazzled by the afternoon sun, in a couple of wide circles and then suddenly, instead of flying ashore, a distance of a yard or two, it suddenly crashed down to the water. After a few struggles, it seemed resigned to its helpless position and lay quiet on the surface, where an obliging Turk in a row-boat at my request picked it up and put it on a dry seat. He misinterpreted my motives, however, thinking them humanitarian and looked startled when I put it in a killing-bottle, for the Turks are averse to taking life. The policeman was very interested and also sympathetic. He was very impressed by the magnificent insect and gingerly smelt the bottle, but made no attempt at a rescue.—M. B.

REVIEWS

"HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: DERMAPTERA AND ORTHOPTERA," by W. D. Hincks. Price, 3/6. 29th July 1949.

This little booklet is Part 5 of Vol. I of this most useful series published by the Royal Society of London. The name of the author is guarantee of accuracy.

It is clearly presented and illustrated, so nobody should now have any difficulty in identifying any British member of the two orders, and a number of the more frequent casual visitors as well. It is also up to date. It is interesting to see the inclusion of the New Zealand Stick Insect, *Acanthorhyla prasina*, Westw., established in several localities on the south coast, *Chorthippus vagans*, Ev., and *Tetrix ceperoi*, Bol. It is a relief to see that the generic name *Tetrix* is restored, which avoids the confusion between *Acrydium*, *Acrida* and *Acridium*, which was sometimes troublesome. The revival of de Geer's name *griseoptera* for *Pholidoptera cinereus* is apparently a disagreeable necessity. *Conocephalus discolor*, Thunb., replaces the long-used *C. fuscus*, Fabr.

The introduction of some American names can no doubt be justified, but the name Camel Crickets strikes a note unfamiliar to Englishmen and the English name Groundhoppers is much more appropriate and less exotic than the American Grouse Locusts, which is an unfortunate name, for these little creatures have only very remote connection with the locusts and none at all with grouse.—M. B.

“BRITISH MOTHS AND THEIR HAUNTS,” by L. Hugh Newman. Small quarto, 150 pp., 130 figs., 130 illustrations. Produced by Messrs Edmund Ward, 16 New Street, Leicester.

This is an excellent work dealing with the British Moths by the gifted author, L. Hugh Newman, who produced a similar volume recently on the butterflies of Britain. A selection of moths has been chosen from varied families. The left-hand page of each opening has a picture of a moth just as it has completed its emergence and resting fully developed. The right-hand page contains a picture of the haunt and surround, which the species is known to be its haunt. Many of these latter are strongly suggestive of protective resemblance. The skill of the author in selection and arrangement of the material is well seconded by the good, useful presentation of the whole.—HY. J. T.

WILL authors who wish to have Reprints please mark their MSS. with the number.

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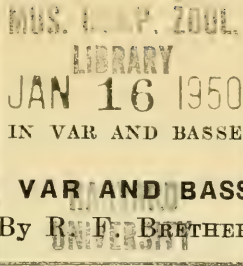
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BUTTERFLIES IN VAR AND BASSES ALPES, FRANCE.

By R. F. BRETHERTON.

My wife and I spent a fortnight in May and June 1949 in Southern France, mainly in the Var and Basses Alpes. These districts seem to be little visited by English collectors nowadays at that season, and some record of the collecting done may be of interest.

We left London on the morning of 20th May, and travelled direct to Cavalaire, arriving at 11 a.m. on the following day. The last two hours of the journey were made by bus from Toulon, through Hyères and along the very fine Corniche des Maures. Cavalaire proved to be an excellent centre, quiet, and off the main track of foreign visitors. The village lies at the point where the steep, rocky coast breaks down into a magnificent sweep of sand, behind which the open slopes are cut by several sheltered valleys which provide cover from the prevailing westerly breeze. On both sides of the village a fine collecting ground is also provided by the light railway track, now disused, which winds at easy gradients along the coast with a number of flowery cuttings and embankments. The stretch between La Croix and Pardigon, a couple of miles east of Cavalaire, proved particularly fruitful.

There was no rain, though a fair amount of cloud and wind, during our week's stay; but before our arrival the weather had been poor, and the number of butterflies was at first small. It increased steadily throughout our stay, and certain species became abundant; but the variety was never great, and only some 37 species were seen. *Papilio podalirius* and *P. machaon* were about in small numbers, mostly rather tattered and tail-less. *Aporia crataegi* was just emerging. The three common Whites were plentiful, but *Pieris manni*, which I had hoped for, was not seen. A few *Leucochloë daphidice* were taken among much larger numbers of *Euchloë crameri*. This attractive insect frequented vineyards and open ground, flying fast and proving difficult to take. It was very variable both in size and in the extent and shape of the green markings on the underside. *Anthocharis cardamines* was still about, and the females were in good condition. There were plenty of *Gonepteryx cleopatra*, very worn, among the *maquis* on the hill-sides; and *Colias croceus* was not uncommon.

The *Satyridae* were poorly represented. *Melanargia syllius* occurred sparingly along the beach and behind Pardigon, but was difficult to capture, especially in a wind. In sheltered lanes *Pararge aegeria*—the typical southern form with the spots a warm brown—was common enough, and there were a fair number of *P. megera* and a very few *P. maera*. A large and richly marked form of *Epinephele jurtina* was emerging in numbers, and there were a few *Coenonympha pamphilus*.

Among the *Nymphalidae*, I was lucky to take one *Charaxes jasius*—a magnificent female measuring 48 mm. from thorax to wing-tip—as it circled round some bushes of its food-plant, *Arbutus unedo*. Another, a male, was watched for some time as it sunned itself fifteen feet up on the branches of a cherry tree, but it would not come within reach of the net; and a distant glimpse was had of a third. Probably a week later they would have been more numerous.

Limenitis camilla (rivularis) was common along the railway track but, though fresh, was hard to get in good condition, as it knocks its wings about very quickly. *Vanessa cardui* was abundant, though worn;

but only one stray example of *V atalanta* was seen. Of the Fritillaries, *Melitaea cinxia* was common behind Pardigon; a single *M. phoebe*, the largest and palest female which I have ever seen, was taken in the same place; *M. didyma* was common in every suitable spot; and a fine race of *M. pseudathalia* was just emerging. These specimens were considerably blacker than those which I have taken in Haute Savoie and in Switzerland, and come closer in appearance to our own *M. athalia*. *M. dejone* is supposed to occur near St Tropez, but I did not find it. A single female of *Argynnis euphrosyne* was taken on the top of the mountain behind Cavalaire, but unfortunately the day on which we climbed it was cloudy, and no doubt other species present there were missed. *Issoria lathonia*, though not common, was widespread.

No Hairstreaks were seen, *Callophrys rubi* being presumably over and *C. avis* perhaps not yet out; and the only Copper was *Heodes phlaeas*, distinctly scarce. The dominant Blues were *Glaucopsyche cyllarus*, *Polyommatus hispana*, and *Lycaenopsis argiolus*, all abundant respectively in flowery places, among rough herbage on the slopes, and in the *maquis*. *P. hispana* was in every condition from rags to newly-emerged. The upper sides of the males are of a paler blue than in our *P. coridon* but the under sides are of a warmer grey-brown, and also appear to be more constant in marking: I saw no variation worth noticing. Apart from these three "Blues" only a few worn *P. icarus* were seen.

The Skippers were interesting. It was a surprise to find *Adopaea actaeon* well out and the commonest of the family: it frequented especially the grass slopes beside the railway. *Hesperia sao* was also fairly common, though worn; and *Augiades sylvanus* was just coming out. A single magnificent *Carcharodus lavaterae* was caught flying over sun-baked rocks near Le Rayol, to the west of Cavalaire; and a very large female *C. alceae* was also taken.

From Cavalaire we moved on for three days at Agay, in the Estorel. The coastal strip there is very narrow and the slopes of the hills, even below their summit ridges of red rock, are exposed and have suffered much from fire and deforestation. The range of butterflies was accordingly small. The only species added to those seen at Cavalaire were *Satyrus circe*—a single early male—and *Strymon spini*, which was locally common among scrub on the slopes behind Anthéor. *M. syllius* and *L. daphidice* were, however, plentiful in some overgrown vineyards, and *V. cardui* simply swarmed, mostly in fresh condition. *C. croceus* was also commoner than at Cavalaire, more than half of the females being of the *helice* form. A fine male *C. jasius* was stupidly missed in the wood behind Cap Dramont. Another interesting find was a well-grown larva of *Deilephila euphorbiae*, which had almost defoliated a group of plants of the Sea Spurge. Its black and red markings made it a striking object on the bare stem.

Beyond Agay we turned inland to Digne, making an impressive four hour journey by bus from Cannes. The road—Napoleon's route on the return from Elba—crosses the bare limestone ranges which lie west of the Provencal Alps, much of it above 3,000 feet; and the occasional meadows were white with wild Narcissus. A promising collecting ground was noted for future use beside the winding road out of Castellane, and a small inn at Séranon looked a likely headquarters if one were working this country with the help of a car.

We spent three nights (1st/3rd June) at Digne. The famous baths were still being renovated and the town itself gave an impression of decay: its chief occupation seemed to be the provision of dèjeuner to the travellers in the long-distance buses which stop there for an hour at mid-day, but this was consistent with the absence of any local bus service whatever. This and rather poor weather made for very scrappy collecting. Even so, the abundance of butterflies was obvious and nearly 60 species were recorded. These included all but about ten of those seen at Cavalaire, the principal absentees being *P. machaon*, *G. cleopatra*, *C. jasius* and *M. syllius*. *P. podalirius* was fairly common and *P. alexanor* was seen three times, but it was flying at a great pace over rough ground and gave no chance to the net. It was probably not yet fully out; certainly we saw no sign of the "groups settling on thistles" which have been described by some collectors who have visited Digne later in June. A few *Leptidea duponcheli* were taken, but it was unfortunately both less common and less fresh than *L. sinapis*. Both sexes of *Anthocharis euphenoides* were common, but only in one spot, at about 2,500 feet on the road up to Courbons. *Colias hyale* was rather commoner than *C. croceus*; and *Gonepteryx rhamni* replaced *G. cleopatra*. *A. crataegi* was numerous.

Notable Fritillaries were *Melitaea aurinia*—locally common near Courbon—*M. cinxia*, *M. phoebe*, *M. parthenie*, and *M. dejone*, which occurred sparingly along with great numbers of *M. pseud-athalia*. *Argynnis dia*, *A. euphrosyne* and *I. lathonia* were also in evidence. *V. cardui* was less common than on the coast, but there were some very bright *Aglais urticae*. *L. camilla (rivularis)* was abundant. The "Browns" were rather poor. Only one *Erebia* was seen, *E. evias*; and that was scarce and in tatters. *P. maera* was common, and a nice race of *Coenonympha arcania*, smaller and darker than those from Northern France, was just emerging.

The only Hairstreak was *Callophrys rubi*, still in fair condition. Among the Coppers, I was pleased to find the brilliant *Heodes alciphron* ssp. *gordius* in fair numbers on a stony hillside above the Barles road; and *H. dorilis* and *H. phloeas* were also about. But the most striking feature was the abundance of "Blues." *P. hispana* occurred locally, though it was less common and more worn than at Cavalaire. *P. bellargus* was common, and with it were a few beautifully fresh *P. hylas* including a very small male with the spots on the under wings elongated into bars—a most striking variety. There were also some *P. thersites*. *G. cyllarus* was nearly over: a smaller and more heavily spotted form than on the coast. *Lycaena arion* was just coming out along the Barles road. *Cupido minimus* was abundant, and with it were many *C. zebrus* and *Everes coretus*, besides the inevitable *L. argiolus*. Both *Plebeius argus* and *P. aegon* were present, though not very common. Most of these "Blues" were flying together on a hillside just north-east of the town, and one might have four or five species in the net at once.

Nemeobius lucina was common, though very worn, on the same ground around patches of cowslip. *H. sao* was plentiful, and a couple of *H. serratulae* were taken. *C. lavaterae* was seen in several places, usually dashing about in rocky gullies; and there were plenty of *A. sylvanus* and *Nisoniades tages*. With better weather and more time for

exploring beyond the outskirts of Digne, the list of species would certainly have been longer still.

We left Digne after lunch on 4th June, and made a four hour journey to Grenoble by rail-car. The railway climbs to nearly 4,000 feet at the Col de la Croix-Haute, and gives magnificent views of the snows of the Pelvoux Massif. Incidentally, the high pastures round the Col look a promising collecting ground. We spent the next day, Whit Sunday, in Grenoble; but there was a fine rain and collecting was impossible. I was, however, interested to watch *Macroglossum stellatarum* flying and ovipositing in numbers on the hill above the citadel, despite rain which was heavy enough to drive us to shelter. We caught the night train to Paris, and so the next day to England to end a very interesting and varied holiday.

My two sons, Michael and Francis Bretherton, were at Cavalaire later on, from 10th to 23rd August. They reported that butterflies were then mostly scarce and in very poor condition. They did, however, bring back some of the second broods of *P. podalirius*, *L. daphidice*, *L. camilla*, *M. didyma*, *M. pseud-athalia*, *P. hispana* and *P. icarus*. Except for *P. hispana* these were all of very small size, no doubt owing to the summer drought. They also obtained a set of *Satyrus statilius*, some worn *S. circe*, a few *Epinephela ida*, *Ruralis quercus*, and a single fine *Hesperia onopordi*, and saw several *C. jasius*. But Cavalaire is a hot place in August.

R. F. BRETHERTON.

Ottershaw Cottage, Ottershaw, Surrey.

AN ATTEMPT TO EXPLAIN THE DEVELOPMENT OF *PIERIS RAPAE* AT PHILADELPHIA DURING THE YEAR 1932.

By O. QUERCI.

Signs: Temp.=Maximum temperature. S.R.=Solar rays. R.R.=Radiation reflected from the ground. Mort.=Mortality of larvae. A=Number of specimens taken by us in the meadow. B=Collecting days. C=Daily average.

(1) May 15-20. Pupae survived to winter produce adults. Females mate at once and lay gradually eggs during about a week. Eggs hatch in 4 or 5 days (b).

(2) May 21-25. On the 21st it rains. Humid ground, weeds, sunshine, feeble R.R. as most S.R. are absorbed both by moisture and plants. Temp. 76°. A few pupae formed (b). After the 25th we see no fresh *rapae* on the wing until the emergence of those of the second brood on June 2nd

(3) May 26. After 4 sunny days the land dries. Scarce weeds. A few more or less old adults continue to fly laying eggs. Intense S.R. strongly reflected from the arid and hot soil. Those larvae, which are not sheltered by weeds, are killed by the radiant energy raising from the soil. Temp. 87° (i, j).

(4) May 27. Unsettled weather in the morning, temp. 70° to 80°. The larvae that have survived and those hatching now are not injured (i). In the afternoon the temp. rises up to 87°, however it rains. Very active larvae; only a few pupae are formed (a) because most caterpillars died.

(5) May 28-31. Moist ground, intense S.R., feeble R.R., temp. 72°. The climate is suitable, but most larvae can not get food owing to the scarcity of weeds (e, b). Only a few larvae form pupae; many others spread all over the country. (On June 2nd we see a few fresh *rapae*. From the 3rd to the 7th we take:—A=47, B=5, C=9. Scarcity due to drouth.)

(6) June 1-4. Aridity increases, temp. 83°. Until the S.R. are absorbed by the remnant moisture (so that the soil does not become hot) the larvae resist (e) and the mature ones form pupae (a). In the afternoon of the 4th: thunderstorm and drizzle. Afterwards: violent S.R. and R.R., temp. 86°. The air is electrized; peculiar smell of drying ground. High mortality of larvae of any size (k). Pupae not injured. (After a week the butterflies are scarce: June 8-11: A=53, B=4, C=13.)

(7) June 5. Strong S.R. and R.R., temp. 90°. The larvae that might have survived, and those hatching now, should die if they are not in sheltered places (i, j). Adults on the wing lay hundred eggs, though they are in a small number.

(8) June 6. Further massacre of larvae lacking of shelter (i, j). (Looking at the data at Table I, one sees that the smell of drying ground did not occur because when it ended to rain it was night). (June 12-14: A=13, B=2, C=7. On the 13th it was cloudy and we did not catch.)

(9) June 7-11. Moderate radiations, temp. 73° to 78°, but scanty weeds (b, e). Some larvae, in moist and still verdant places, pupate. Others resist starvation. In spite of the drouth and harmful climate of the past days, we see some larvae in the platband around the fountains of the monument to General Washington at the Parkway, where there are some weeds. (June 15-17: several adults are on the wing: A=123, B=3, C=41.)

(10) June 12-14. Cloudy, rainy, temp. max. 70°, min. 60°. Those larvae in the meadow, that had become feeble for long starvation, collapse (d). The others are little active (b). (June 18-21: A=49, B=4, C=12.)

(11) June 15-17. Heavy rains, wind 30 miles per hour in the afternoon of the 15th. Further destruction of larvae (m). Eggs and pupae little injured. (June 22-24: A=27, B=3, C=9.)

(12) June 18-21. The torrent rains of June 15th penetrated scantily into the ground that now is drying. Feeble S.R., temp. 60° during the nights. If in the meadow there are still some starving larvae they must die (d). (June 25-28: A=24, B=4, C=6.)

(13) June 22. Intense S.R. and R.R., temp. 90°, lack of food-plants and shelters. Perhaps no larvae remain alive in the not shaded land in which we collect (i). Adults lay eggs. (June 29-30: A=14, B=2, C=7.)

(14) June 23-25. Temp. drops: min. 60°. Larvae hatching now survive owing to plenty of sunshine (e), as one sees at Table I.

(15) June 26. Violent waves of radiations, temp. 92°, scanty rain followed by intense S.R., electrized air, smell of drying ground (k). At the Park Way we see no *rapae*. We take 5 specimens in a damp and shaded locality, near Germantown, where we go and get plants having at home some eggs. Many eggs, not yet hatched, are also in the meadow where we daily collect.

(16) June 27-29. It rains during the night. Our collecting place becomes verdant. After the rain the solar radiation is intense, but the humidity absorbs it. Temp. 86°. Active larvae (a). (July 1-3: A=26, B=3, C=9; July 5: A=14, B=1, C=14. Most specimens are worn. Likely they emerged in some damp and shaded localities: like that of Germantown, and came at the Park Way where the field is flourished.)

(17) June 30. Moisture, temp. 89°, many blossomed weeds. Larvae active (a).

(To be continued.)

OBSERVATIONS ON THE LIFE HISTORIES OF CERTAIN BUTTERFLIES OF FREETOWN, SIERRA LEONE.

By Surgeon Lieutenant-Commander H. M. DARLOW, F.R.E.S., R.N.

Mycalesis vulgaris, Butl.

Ovum:—Globular; greenish-white; deposited singly on grass blades.

Larva:—First instar dull white with a black head; consumes the egg shell for its first meal.

Third instar pale green speckled with white; lateral line bright green; head black with four short black posteriorly directed horns, the outer pair being very short.

Fourth instar pale green with dark green mid-dorsal line and white lateral line; generalised fine dark green speckling; each segment ringed with five raised annular wrinkles; head black with two small black horns posteriorly directed; anal horns pale brown; thoracic legs green.

Fifth instar brown finely speckled with white; dark green dorsal line, flanked on either side with an undulating darkish line; very faint dark dorso-lateral line; lateral line white; cream dorso-lateral spot on the posterior edges of abdominal segments two to five inclusive; generally distributed fine hairs, white at bases; head brown with paler median line; horns brown; well marked neck; legs and ventral surface brown.

Pre-pupal stage green with dark green dorsal line.

Pupa light green; pale green dorso-lateral spots on the abdominal segments; few fine diffuse mottles on the wing-cases; the costal edges of the wing cases slightly raised to form low ridges, the surface otherwise being featureless. Suspended by the cremaster low down on grass blades.

The larva feeds in captivity on a variety of grasses. The species is common all the year round, and occurs especially, but by no means always, in shaded places.

Charaxes boueti, Feisth.

This species is rare in Freetown, and I only possess two specimens, both bred from larvae found on the same day on the same bamboo plant in the Wellington Gorge. The two larvae were possibly of the same brood, as they pupated and produced imagines more or less simultaneously. Aurivillius in Seitz, *Macrolepidoptera of the World*, Vol. 13, states that the female is unknown. Three years ago, however, I had the pleasure of examining the specimens of this species in the British Museum. There were, I think, seven specimens, two or three

of which were females. My specimens represent both sexes, though the female is hopelessly crippled except for one forewing. The male is very small and much less heavily marked than any of the B.M. specimens that I examined.

Larvae:—Mature larva bright green above with buff, black bordered, longitudinal, oval markings dorsally on abdominal segments three and five; lateral line brown, bordered below with cream; ventral surface dull white; head green above and buff below with three pairs of posteriorly directed horns on the hinder edge, the outer pair of medium length, middle pair long and the inner pair very short and close together; pair of short green anal horns.

Pupa:—Cream, pinkish on the dorsum of the thorax; diffuse longitudinal olive-grey markings. Attached by the cremaster only.

In the wild state the larva appears to feed on bamboo, but in captivity also fed on various grasses and on the leaves of the oil palm.

Acraea zetes, Linn.

Larva:—Ground colour buff; each segment ringed with a black band from which arises a series of brownish-black branched spines, two on the first thoracic segment, four on the second and third, six on each of abdominal segments one to eight inclusive, and two each on the ninth and tenth; head brown; legs and spiracles black.

Pupa:—Ground colour pinkish-white; winguration, legs, mouth parts and thorax outlined in black; black ventral, spiracular and dorso-lateral lines with orange centered nodes on each segment. Suspended by cremaster only. Very active.

The larva was found on *Modeca palmata*, but there was some reason to suspect that it fed on other plants also.

Acraea terpsichore, Linn.

Larvae:—Young larva pale yellowish-cream; spines as in the above species but buff, those on the thoracic and anal segments being tipped with black.

Final instar larva pale green; head light brown; spines all black and arising from small buff tubercles.

Pupa:—Buff; dorso-lateral and spiracular segmentally arranged rows of black rings representing the segmental nodes of the longitudinal lines of the pattern of the larva of the above species. Cremaster black.

The food-plant was not identified.

Papilio demodocus, Esp.

This species was very common in Freetown all the year round in the neighbourhood of habitations, where it is much attracted to flowers and oviposits on *Ditrus* trees, Lime being the most popular. In the bush it was, however, quite scarce, and I once saw a female ovipositing on a sapling tree with spines and glandular compound leaves, which I took to be *Citropsis* sp.

Having bred large numbers of the related species, *P. demoleus*, in Ceylon (*Entom.*: LXXVIII, p. 70), I set out to make a comparative study of the larvae of the two species. They are extraordinarily similar, but differ in the following respects:—

(1) In *demodocus* the osmaterium is light brown tipped with magenta, whilst in *demoleus* it is always pink.

(2) The oblique stripe on the fourth and fifth abdominal segments of *demodocus* is black bordered with cream and speckled with blue, and the contra-lateral stripes occasionally meet dorsally. In *demoleus* the stripes never meet dorsally and are occasionally absent altogether. They are grey, brown or black, but when black are never bordered with cream. whereas the grey and brown forms are usually so bordered.

(3) On the sixth abdominal segment there is a single grey, brown or black dorso-lateral spot in *demoleus*, bordered in the same way as the stripe on segments four and five. It is not always present. In *demodocus* the spot is always present and is always black bordered with cream. It is often produced anteriorly to the hind border of segment five as a thin streak. Furthermore, there is always a second more laterally placed, but similarly coloured spot, which is never present in *demoleus* in Ceylon.

(4) In *demoleus* there may be dorso-lateral spots on any or all of abdominal segments 1, 2, 3, 7, 8, or 9. I never found such spots in *demodocus*.

(5) In *demoleus* the third thoracic segment is bordered anteriorly and posteriorly by a grey, or occasionally brown or black band. In *demodocus* these bands are always black and unite laterally to form a large black patch. Furthermore, in *demodocus* along the posterior edge of the anterior band and the anterior edge of the posterior band there are two rows of brown slightly raised tubercles, which are conspicuously bordered with light blue.

(6) In *demodocus* the first thoracic segment is bordered "fore and aft" with black.

Apart from the difference in colour of the osmateria, these differences are more or less a matter of degree. In every other respect the larvae appear indistinguishable. It would be interesting to study the differences in areas where the two species overlap.

The pupae of *demodocus* vary in the same way as those of *demoleus*, though I rather gained the impression that the anterior horns were longer in the former species.

Papilio pylades, Fabr.

Ovum:—Globular, 0.75 mm. in diameter; greenish-white when first laid, but later honey-yellow. Laid singly on the uppersides of leaves.

Larva:—First instar silver-grey, each segment ringed with black tubercles, each bearing a black, branched, white-tipped spine; dorso-laterally on the thoracic and anal segments a pair of buff fleshy horns bearing numerous buff spines; head and anal segment buff.

Second instar buff below, creamy-white above except for dorsum of T2, A1, 7 and 8 which are black; apart from these each segment bears a broader anterior and a narrower posterior yellow ring bordered with black, on the anterior segments the yellow tending to be obscured by extensions of the black borders, from which the spines arise; first thoracic and anal segments are bright orange above and buff below; horns on thoracic and anal segments are buff with black spines; head black and buff; spiracles buff; supra-spiracular line brown.

Third instar greenish except for T2, A1 and 3 which are almost entirely black above; other segments bear two greenish-yellow rings

with black borders between which is a faint whitish ring; yellow unbranched spines on T1 and anal segments; other spines black.

Fourth instar green, each segment ringed with two pinkish rings; supra-spiracular line white; bordered above narrowly with yellow and below broadly with pinkish-green; a single pair of short black horns on thoracic segments and yellowish-green on the anal segment; spiracles black; T2 and 3 swollen.

Fifth instar green with yellow supra-spiracular line; horns on T1 black with yellow bases, those on T2 and 3 bright orange with black tips, and those on the anal segment yellowish-green; spiracles dark green.

Pupa:—Pale green mottled with darker and pinkish in such a way as to mimic the venation of the leaf to which the pupa is attached. A large horn extends anteriorly from the middle of the thorax to a point beyond the anterior end of the pupa. There are pale lateral and dorso-lateral lines extending from the cremaster to the tip of this horn.

The larva moved with a peculiar jerking gait. It fed on a common shrub, which I was unable to identify. It rested along the mid-rib of the upper side of the leaf. The butterfly was very common all the year round, especially during the wet season, and was much attracted to flowers.

Platylesches picanini, Holl.

Larva:—The young larva whitish with a black head. Older larva slug shaped with a large head and narrow neck. Ground colour green finely speckled with minute yellow dots; head black, ringed round its broadest diameter with brown, and bearing a radially arranged pattern of white patches anteriorly.

Pupa:—Thorax transparent; abdomen buff. Spun up in a rolled leaf.

The larva lived in a leaf tube by day, emerging at night to feed. The food plant was a small tree, unidentified, but resembling a beech. Both larva and pupa covered with a protective layer of white powdery wax. The larva turned bright pink before pupation.

Coeliades forestan, Cram.

Unfortunately my notes on the life history of this interesting species have been lost during my travels, but it had one interesting character which sticks in my memory. The larva, which was typically hesperid in shape, was brightly coloured and was distinctly reminiscent of the larva of *Papilio machaon*. Despite this it lived concealed by day in a leaf tent, from which it only protruded its anterior segments at night to feed. The food plants were various species of beans, both cultivated and wild.

OBITUARY.

WILLIAM FASSNIDGE, M.A., F.R.E.S.

William Fassnidge died at Southampton on 19th April 1949, aged 61. He was born at Chesham in 1888 and was educated at Amersham and London University. He taught for a few years at Chippenham, and came to King Edward VI Grammar School, Southampton, as Modern Language master in 1915. There he served for more than 33 years,

becoming in due course senior modern language master and latterly second master.

A chance encounter in the field in my school-boy days about thirty years ago began a long and valued friendship, in the course of which I picked up many useful tips, e.g., how to find the larvae of the white admiral, hairstreaks and clearwings, and that strange gall on the sallow which ultimately produced *Aegeria flaviventris*, Staud., a species new to Britain.

He spent most of his vacations on the Continent, collecting in little-known districts and recording his captures chiefly in this Journal, of which he was one of the editors, but also in French periodicals. Indeed, my first visit to France was made in his company. He was associated with various international organizations and was Treasurer and a former President of the Southampton Branch of L'Alliance Française, where I often heard him speak in the vernacular.

I do not know if he played much Bridge in recent years, but I still remember being introduced to the game at his house and failing to take a single trick after a rash bid of three no trumps. That lesson, and the need for a guard in *every* suit, was well learnt. Another of his hobbies, shared by his wife, was philately, and this led to his founding a Stamp Club at his school.

It is as one of the Founders of the Hampshire Entomological Society, which was subsequently to develop into the Society for British Entomology, that he will be best remembered by readers of this Magazine. Early meetings of this organization were held at his house on Saturday afternoons, Mrs Fassnidge generously providing excellent teas. Later meetings were held at the University College, Southampton, but members were always invited to Tennyson Road, where they chatted round the tea tables and subsequently consulted his extensive collections and library.

He became a Fellow of the Royal Entomological Society of London in 1925 and for many years was their representative on the New Forest Joint Committee. The first world war found him as an officer in the Kings Liverpools and the second with the Poole Home Guard. While on duty on Salisbury Plain in 1942 he was seriously injured in a shooting accident, from which he never fully recovered.

Mr S. N. A. Jacobs has acquired his fine collection of Microlepidoptera, and the remainder of the insects will pass to the British Museum (Nat. Hist.).

He leaves a widow and one son, to whom we offer our warmest sympathy.—B. M. HOBBY.

[See also pp. 58-59 *ante*.—ED.]

COLLECTING NOTES.

BUTTERFLIES FROM S.E. IRELAND.—The following fifteen species of butterflies occurred within a radius of two miles of this property (Corballymore), and were more or less common:—*Pieris brassicae*, *P. napi*, *Leptidea sinapis*, *Euchloe cardamines*, *Vanessa atalanta*, *V. cardui*, *Pararge megera*, *P. egerides*, *Maniola jurtina*, *M. tithonus*, *Aphantopus hyperantus*, *Coenonympha pamphilus*, *Aglais urticae*, *Lycaena phlaeas*,

Polyommatus icarus; seven others were scarce, viz.: *Pieris rapae*, *Colias croceus* (one ♂, 17th October), *Nymphalis io*, *Argynnis paphia*, *A. aglaia*, *Lycaenopsis argiolus*, *Eumenis semele*. The abundance here of *Vanessa atalanta* and *V. cardui* is worthy of mention.—L. H. BONAPARTE WYSE, Corballymore, Co. Waterford.

CHOICE OF FLOWER OF *VANESSA CARDUI*, L., AND *V. ATALANTA*, L.—When at Newquay in September last, I was interested to note a marked preference of blossom between *Vanessa cardui*, L., and *V. atalanta*, L. *Cardui* was in abundance along the cliffs and a brood of *atalanta* emerged about the 5th, and joined them.

On one patch of valerian I observed some 40 *cardui* and but 2 *atalanta*, while nearby, on a large patch of overhanging ivy in full blossom, were probably 80 or more *atalanta*, but only 3 or 4 *cardui*. The numbers of insects on the ivy were more difficult to assess as many were hidden, but a stick thrown into any part of the bush brought out a shower of *atalanta* which turned and quickly dived back into it.

A few *Pieris brassicae*, L., also seemed to enjoy ivy, also a rather late, solitary ♂ *Celastrina argiolus*, L., was noted. On the valerian, *Macroglossum stellatarum*, L., was in fair numbers.—G. H. B. OLIVER, Hazlemere, High Wycombe, Bucks.

CEROSTOMA XYLOSTELLA ON SNOWBERRY.—In June last year I found a larva of *Cerostoma xylostella*, Linn., feeding in the wild state on Snowberry in my garden. Along with the well-known *Limenitis camilla*, L., and *Euphydryas aurinia*, Rott., it appears that another honeysuckle feeder will also eat snowberry.—G. H. B. OLIVER, Hazlemere, High Wycombe, Bucks. [See p. 72 ante.—Ed.]

VOLUCELLA ZONARIA, PODA.—On 28.vi.49 I saw *V. zonaria* settle on the garden fence at 8.30 a.m., another was seen on 20.vii.49, while a third was seen at Sutton Green at the bottom of this road on 4.x.49. I have, however, only seen two Hornets near here during the Summer.—J. FINCHAM TURNER, 68 Oakhill Road, Sutton, Surrey.

HERSE CONVULVULI IN SCOTLAND.—I caught a perfect specimen of a convolvulus Hawk moth (*Herse convolvuli*) at Ardtur, Appin, Argyll, on October 14th—and as I am told that this moth does not often occur in Scotland I am writing to report its capture. The length of the wing from the shoulder is $2\frac{1}{8}$ ins.—(Mrs) M. C. SPICER.

RHYACIA SIMULANS, HUEN., IN HERTS. AND BUCKS.—Mr A. L. Goodson took two specimens of *Rhyacia simulans*, both in very fresh condition, in his light trap in Tring, 26.vi and 28.vi.1947, and Mr G. H. E. Hopkins took another at Aston Clinton, Bucks., 7.viii.1948. I found, 30.vi.1949, the head, front part of the thorax with both forewings, and one hindwing of a very fresh specimen in my porch in Tring, Herts. It had been killed by a bat.

In all the years during which the late Mr A. T. Goodson collected in this neighbourhood he never obtained this species. It has been much commoner than usual in the Cotswolds in recent years, but I do not think the species has spread from there to this district, because two of the Tring specimens are darker than any I have seen from the Cotswolds.—E. A. COCKAYNE, 8 High Street, Tring.

CURRENT NOTES.

It is with much gratitude that I have to acknowledge from my good friend, B. J. Lempke, of Amsterdam, the receipt of Part VIII of his *Catalogue of the Netherland Macro-Lepidoptera*. This is a volume made up of reprints from the *Tijdschrift*, XC. Under name Agrotidae it includes all those species hitherto known as Noctuidae.

The best thanks of the *Ent. Record* are due to B. J. Lempke for his many contributions of many items for the Noctuae Supplement for many years past. We thank him.

In the 18th century the XII ed. of Linn *Sys. Nat.* was issued in 1766. The following year a verbatim edition was issued. As both are identical, it would be advisable to write the date (1766-67).—HY. J. T.

WE have recently received Part 9 of the *List of Generic Names of British Insects*. This part deals with the Staphylinidae; a check list of the British species is added. There are about 120 pages and reference for each genus. This part concludes Vol. I (1934-1949). The sections considered are Rhopalocera, Odonata, Hymenoptera, Neuroptera, Carabidae, Hydradephaga, Hemiptera-Heteroptera, and Staphylinidae. In addition, there is an Index of the whole of the generic names in the volume and their synonyms.

PART I of Volume X of the *Transactions of the Society of British Entomology*, recently published, contains a valuable paper on the Ecology of Aquatic Hemiptera-Heteroptera, by E. J. Popham, D.Sc., Ph.D., A.R.C.S. Such papers are most useful for the disclosure of the real natural history.—HY J. TURNER.

REVIEW.

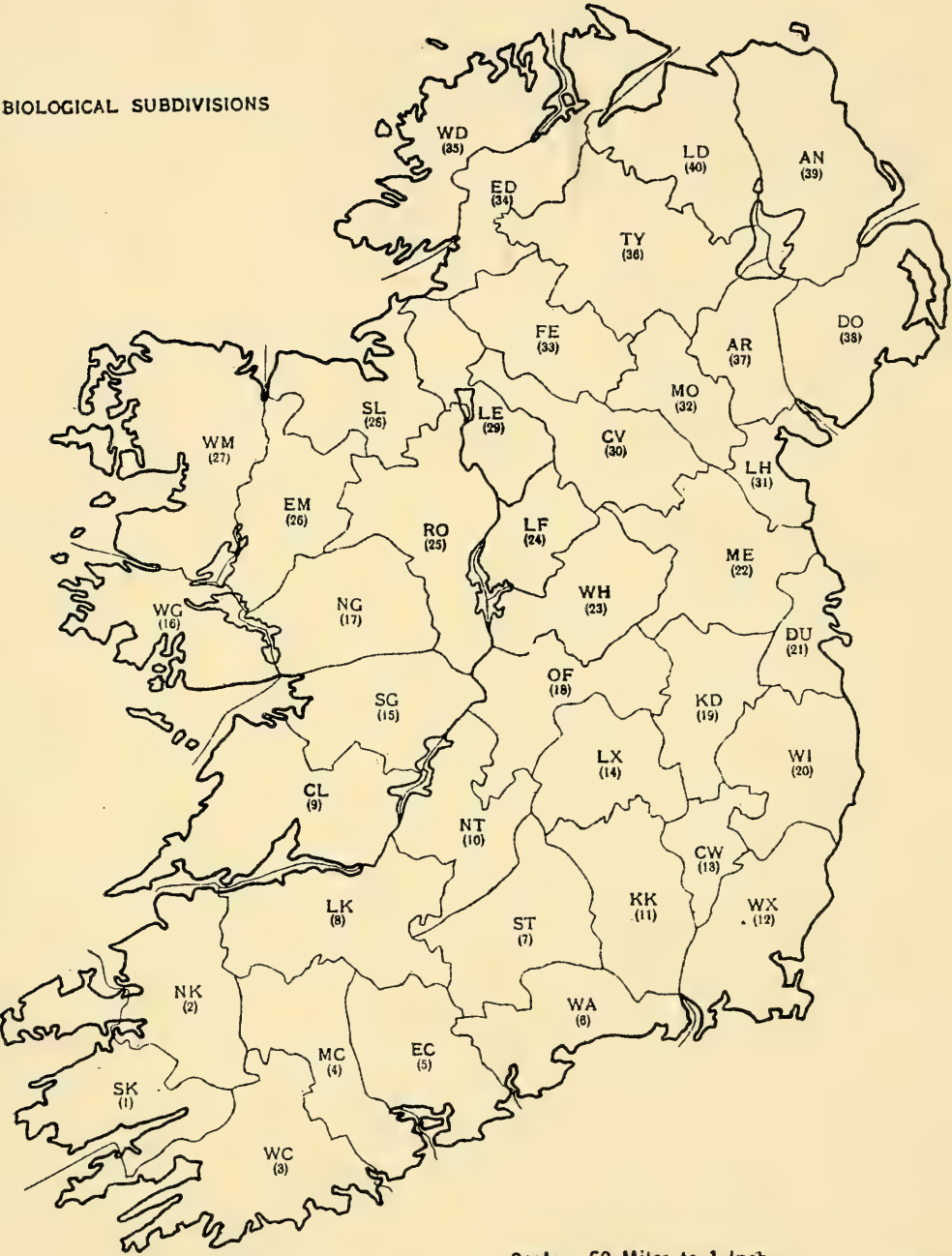
THE RECORDING IN A BIOLOGICAL SURVEY (Irish Ordnance Department Survey).—Students of Biological Science usually choose an area of limited size to obtain their facts. When such facts have been obtained there seems to be no general method of recording. Each student has his own method and all are most difficult to follow, much less to use.

We have just received a map from the Irish Ordnance Survey, Phoenix Park, Dublin, which seems in plan to suffice for a successful result.

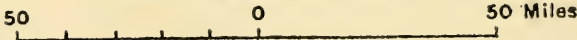
The plan is applied to the whole of the country; each of the innumerable small areas are located and filled with reference markings indicating data and the biological facts.

The larger map would cover the surface of a table 3 ft. by 4 ft. It can be obtained for 3/- from the Ordnance Department, Phoenix Park, Dublin, and all booksellers. It is admirably produced, divided into small areas of which each have reference marks indicating the existence of records for that section.

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SPECIAL INDEX.
HARVARD UNIVERSITY
VOL. LXI., 1949.

The Entomologist's Record and Journal of Variation

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* indicates a new name.

** indicates an addition to the British List under an old name.

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Syngrapha, Hb., *interrogationis*, L.

Plusia, Ochs. & Tr. (1816-26). Very many authors. [*Phytometra*, Haw. (1809): a few authors: *Syngrapha*, Hb. (1806), Stz. works.]

Hufn., *Berl. Mag.*, III, 212, No. 15 (1766), said that *interrogationis* was similar to *gamma* only that the silvery coloured spot was a fragmentary character.

Schiff., *Verz.*, 93 (1775), Z. 3: *interrogationis*, L. Larvae semi-geometrae. Phal. Noctuae Metallicae. Larvae on the common nettle. Grouped with *festucae*, *chrysitis*, *circumflexa* and *gamma*.

Illiger, *Revised Verz.*, V, 347, (93), Z. 3 (1801), named it "The Nettle Noctua." He cited Linn., *Syst. Nat.* and *Fn. Suec.*; Esper; Fab.; Bork., etc.

Fab., *Syst. Ent.*, 607 (1775), cited Linn. as the author. His description: "anticis fusco cinereoque variis signo. albo inscriptis," was most inadequate.

Goeze, *Beitrage*, III (3), 126 (1781), cited *Berlin Mag.* (1766); Fab., *Syst. Ent.* (1775); Fuess., *Schw. Ins.* (1775); Schiff., *Verz.* (1775).

Bork., *Schmett. Noct.*, IV, 792 (1792), cited Linn., *Syst. Nat.*, XIIed., 884 (1767) and gave the description. Also he cited Linn., *Fn. Suec.*; Müller, Ueber; de Vill., *Ent. Linn.*; Fuess., *Schw. Ins.*; Hufn., *Berl. Mag.*; Esper, *Schmett. Noct.*; Göze, *Beitr.*, etc.

Ernst & Engram., *Pap. d'Eur.* (1792), VIII, 132, fig. 593 a, b (and c, d), gave 3 figures, very good illustrations of 3 different forms. On p. 124 they discuss the *conscripta*, Hb., of the *Beitrage*, II (2), 52, plt. IV, fig. U. The authors remark on Hb., "The individual example which served him as a model was, doubtless, incorrectly drawn, for his colours are much too pale for this species. He described his species as the Noct. *aemula*, Fab., *Mant.*, 162. Perhaps it is the same species that this author has described under two names."

The omission of recording the rosy suffusion in all the earlier descriptions has been the cause of the withdrawal of several aberrational names. The action of Tutt in 1892 of naming a form ab. *rosea* made the following names to fall as Synonyms:—ab. *borealis*, Reut., *Act. Finn.* (1893); ab. *aurosignata*, Don., *English Ins.* (1808); ab. *aemula*, Fab., *Mant.*, I (1787).

Hb., *Samml. Noct.*, 281 (1800-1803) gave a very good figure, somewhat darker than that of Dup. Hb. had already figured this species in his *Beitr.*, II (2), p. 52, plt. 4, U (1791), under the name *conscripta*.

Haworth, *Lep. Brit.*, 257 (1809), described it "alis cinereo fusco roseo-que variis, in medio littera V puncto-que contiguo., argenteis."

"Praecedentibus differt statura minore; alis anticis roseo cinereo fuscoque perpulchre variegatis et potissimum caractere argenteo Cilia rosea fusco maculata."

This species was known to Moses Harris as above cited, where he remarks that it "is a different species from the *Phalena interrogationis* of Linnaeus." In this, however, probably mistaken, as there are hardly any doubts about this being *N. interrogationis* of Fauna Suecica, although Linnaeus makes no kind of mention of its beautiful purple tints. It is not the *interrogationis* of Hübner, nor does it exactly accord with his *Noctua ni*; although closely allied to both.

Dup., *Hist. Nat.*, VII (2) (1829), 47, plt. 137 (not 136 as printed), fig. 2. The figure is a good one but somewhat lighter than the average examples, and chequered fringes of the forewings are very clear and distinct. If it were tinted with rose colour that has vanished with time. The transverse shades are well in evidence. He has cited the double, i.e. Donavan and his *Tortrix*. He described this species a grey-brown like *gamma* and with the same marking; with the same silver characters as *P. ni*, only smaller, and the underside of all wings is "exactly" like that of *P. gamma*.

Treit., *Schmett. Noct.*, V (3), 190 (1826), said that Linne's species was the species called *aemula* by Fab. and Bork., but recognized as the true *interrogationis* by Schiff. in the *Verz.* in the *gamma* group. He cited about 20 works in which this species had been dealt with; several of which are not often referred to. Illiger in the *Neu. Magazine*, II, 146 (1822) (1803); Harris, *English Ins.*, plt. 3 (1782); Rossi, *Faun. Etruse.*, II, 183 (1795); 1st ed. Laspeyres, *Brit. Revis.*, 145 (1803); Goeze, *Ent. Beitr.*, III (3), 126 (1781); Fuess., *Schw. Ins.*, 38 (1775); in error he quoted Donavan, *Nat. Hist.*, II, plt. LXVI (1903), *interrogationana*, diagnosed, described, figured and named as a *Tortrix*. [Mr Fassnidge has determined this figure as *Eucosma foenella*.]

Freyer, *Beitr.*, III, 116, plt. 130, fig. 1 (1830), gave an excellent figure of a dark continental form with fairly distinct light main characters.

Gn., *Hist. Nat.*, VI (2), *Noct.*, 354 (1852), said that since Haworth described this species as being much suffused with rose he could not discuss this species.

H.-S., *Sys. Bearb.*, II, 339, 5 (1845+)?, gave no figure, nor did he comment on the figures of authors, especially Hb., he cited. But he gave a description noting most of the characters, a selection of which might be found on any specimen. He recognized the unstable nature of any character and would not describe a "type."

Splr., *Schmett. Eur.*, I, 305, plt. 50, 11 (1907), gave a very good figure, dark with a considerable amount of lighter marking fairly distributed but not strong. The silvery metallic character was well emphasized. He adds ab. *flammiifera*, Huene, ssp. *transbaicalensis*, Stdgr.; ab. *rosea*, Tutt. He refers to its extreme variation and its extensive area of distribution.

South, *Moths B. Is.*, II, 73, plt. 26, f. 4-5 (1908), gave two very good figures, one very dark and the other light; he referred to the violet purple tinge "when first emerged," and that some have even an amount of blackish suffusion.

Warr.-Stz., *Pal. Noct.*, III, 346 (1913), gave *aemula*, Fb. (nec Schiff.), *aurosignata*, Don., and *borealis*, Reut., as Syns. They gave 6 figures: typical, *orbata*, *flammiifera*, *igniifera*, *cinerea* and *gammifera*. Warr. described ab. *orbata* 64 b; ab. *igniifera*, 64 c; ab. *cinerea*, 64 c; and ab. *gammifera*, 64 c; and figured and described *flammiifera*, Huene, 64 b. In Stz. work this species was taken from *Plusia*, Ochs. (*Phytometra*, Haw.) and placed in *Syngrapha*, Hb., p. 345.

Tutt had referred (1892) to the endless varieties of this species, a remark which appears to have attracted attention of entomologists interested in Variation. It will be noted that the recorded aberrations are practically all dated subsequent to 1892.

Culot, *N. et G. d'Eur.*, I (2), 176, plt. 72, f. 4 (1916), gave a very good but very dark Swiss specimen. He gave a condensed but lucid account of the lines of variation and the clear differences from resemblance to *P. gamma*, which latter was dominated by its grey suffusion while it never had the bronze reflection always so dominant in the *interrogationis*.

Meyrick, *Handbk.*, used *Plusia* in both editions (1928) 7?

Drdt.-Stz., *Pal. Noct. Supp.*, III, 220 (1936), separated *cinerea*, Warr., and its form *gammifera*, Warr., as a true species: said that *annulata*, (Hamp.) Strand, was a Syn. of *orbata*, Warr., and that *confluens*, (Hamp.) Strand, is a Syn. of *flammiifera*, Huene. Drdt. said that the *aureomaculata*, Vorb., had a golden mark instead of a silvery one; that in *aureoviridis*, Wgnr., the forewing is largely suffused with golden-green.

Drdt.-Stz., *l.c.*, p. 266 (1937), reported ab. *magnifica*, Rang., an ab. with an unusually large and prominent silver character on a rich brown velvety area of forewing.

Of the Variation Barrett said:—

Usually only variable in the depth of the black clouding, and in the shape of the Y, which is very irregular. In a specimen in the collection of Mr A. C. Vine it is produced into a long attenuated and enlarged stripe of rich gold colour toward the base of the wing. Those taken in Londonderry by Mr Milne have a beautiful flush of purple over the forewings.

Tutt dealt with the (1) early descriptions, Linnaeus, Zetterstedt, Guenee, Oberthur, and (2) named the colour, not before emphasized, as *rosea*.

The Names and Forms to be considered:—

interrogationis, L. (1758), *Sys. Nat.*, Xed., 513.

aemula, Fab. (1787), *Mant. Ins.*, II, 162. Syn.

aureosignata, Don. (1808), *N. Hist. Brit. Is.*, XIII, 43, plt. 459.

ab. *rosea*, Tutt (1892), *Brit. Noct.*, IV, 36.

ab. *borealis*, Reut. (1893), *Act. Fenn.*, IX, 97. Syn.

ssp. *transbaicalensis*, Stdgr. (1892), *Iris*, V, 371 (Stdgr., *Cat.*, IIIed., 139).

ab. *aureomaculata*, Vorb. (1911), *Schmett. Schw.*, I, 426.

ab. *orbata*, Warr.-Stz. (1913), *Pal. Noct.*, III, 346, plt. 64 b.

ab. *flammiifera*, Huene (1913), *l.c.*

ab. *igniifera*, Warr.-Stz. (1913), *l.c.*

ab. *cinerea*, *l.c.*, sp., see Drdt.-Stz.

ab. *gammifera*, *l.c.*, sp., see Drdt.-Stz.

ab. *annulata*, (Hamp.) Strand (1913) (1916), *Lep. Phal.*, XIII, 431; *Arch. Noct.*, LXXII, A. 2, 71.

ab. *confluens*, *l.c.*

ab. *simplex*, *l.c.*

ab. *aureoviridis*, Wagnr. (1926), *Zt. Oest. Ent. Wien*, XI, 26.

ab. *magnifica*, Rang. (1935), *Ent. Rund.*, LII, 22 (1935).

ab. *aurosignata*, Don., *Nat. Hist. Brit. Ins.*, XIII, 43, plt. 459, 1 (1808), figured and named a Noctuid *albosignata*. Wrbng., *Beitr.*, II, 287 (1864), said it was *interrogationis*.

ab. *transbaicalensis*, Stdgr., *Iris*, V, 371 (1892).

DESCRIP.—*Cat.*, IIIed., 239 (1901)—“al. ant. magis grisescentibus, al. post. dilutioribus vix nominanda.”

ab. *aureomaculata*, Vrbt., *Schmett. Schweis.*, I, 426 (1911).

ORIG. DESCRIP.—“A rarely occurring form in which the usually silvery-white character is bright shining golden.”

ab. *orbata*, Warr.-Stz., *Pal. Noct.*, III, 46, plt. 64 b (1913).

ORIG. DESCRIP.—“The silvery mark is highly variable, either forming a simple loop with fine silvery edge, or as ab. *orbata* followed by a small silvery dot as in the type form.”

ab. *flammifera*, Huene, Warr.-Stz., *Pal. Noct.*, III, 346, plt. 64 b (1913).

DESCRIP.—“A large round spot conjoined to it, nearly separate, a development of *orbata*.”

ab. *annulata*, Hamps., Strand, *Cat. Lep. Phal. Noct.*, XIII, 431 (1913): *Arch. Noct.*, LXXII, A. 2, 471 (1916).

ORIG. DESCRIP.—“Forewings with a small annulus confluent with the outer edge of the stigma at inside.”

ab. *confluens*, Hamps., Strand, *l.c.*, *l.c.*

ORIG. DESCRIP.—“Forewing with a small spot confluent with the stigma below.”

ab. *simplex*, Hamps., Strand, *l.c.*, *l.c.*

ORIG. DESCRIP.—“Forewing without spot or annulus.”

ab. *ignifera*, Warr.-Stz., *Pal. Noct.*, III, 346, plt. 64 c (1913).

ORIG. DESCRIP.—“Has the usual silvery or pale yellow mark as in some examples of *flammifera* shaped like a tadpole with deep fiery red scaling before the outer line beyond the inner and along the submedian fold.”

ab. *cinerea*, Warr.-Stz., *Pal. Noct.*, III, 346, plt. 64 c (1913), was described and figured as a form of *interrogationis*, but now Drdt.-Stz., *Pal. Noct. Supp.*, III, 220 (1936), is declared a true species and that form *pyrenaica*, Hamp., is a syn.

ab. *gammifera*, Warr.Stz., *l.c.*, “is certainly a form of *cinerea*.”

ab. *aureoviridis*, Wagnr., *Zeit. Oest. Ent. Ver.*, XI, 26 (1926).

ORIG. DESCRIP.—“It had all the characteristic marking of the normal forewing but was a very striking variety. As regards the whole of the costal margin area of the forewings up to the gamma-mark, as also the basal, the surrounding areas are strongly bedecked with golden-green scales, which colour gives the whole creature a brilliant and quite distinct appearance. Of the normal ground colour there is left only a small portion of the lower-half of the forewing's gamma marking.”

ab. *magnifica*, Rangn., *Ent. Rund.*, LIII, 22, fig. (1935). The reference in Drdt.-Stz., III (1937), is wrongly given as 1936. This class of error occurs frequently in quoting from magazines which do not run concurrently with the annual calendar, e.g., *Ent. Rund.*, LIII, was published from October 1935 to September 1936, and the volume labelled “1936.”

A. Amphipyra, Ochs. & Tr., *pyramidea*, Linn.

Amphipyra, Ochs. & Treit. (1816) (1825). Most authors.

Hufn., *Berl. Mag.*, III, 288, No. 32 (1766), *pyramidea*, gave the following DESCRIPTION:—"Dark brown, with part black-brown, partly yellowish marking; the lower wings red-brown."

Roesel, *Belust.*, I (II), plt. XI, 4-5 (1746?), gave 2 very good figures, 4 spread, 5 at rest, very dark European forms with markings clear but not emphasized to produce a light submarginal area as in many British forms.

Schiff., *Verz.*, 71, G. 1 (1775), classified *pyramidea* on the larval characters and proclivities. It is recognized as a Linn. species.

Illiger, in his revised *Verz.*, I, p. 201, G. 1 (1801), cited the description of Fab., *Ent. Syst.*, III, 2, p. 98. He also cites excerpts at considerable length on the larva from the well-known Kalender of Brahm.

Goeze, *Beitr. Lep.*, III (3), p. 175, No. 181 (1781). This work usually records descriptions of species which are almost unobtainable. In this case we are able to quote from Hufn., *Berlin Mag.*; Roesel, *Belust.*; Reaum., *Mem.*; Schiff., *Verz.*; Fab., *Syst. Ent.*; Geoffroy, *Ins.*, etc.

Esp., *Abbild. Noct.*, IV, 632, plt. CLXXI, 1-3 (1790+?), gave a figure fairly recognizable, especially as the good figure of a larva is on the same plate. Teste Wernebg.

Ernst & Engram., *Pap. d'Eur.*, VIII, 96, f. 337 d, c, e, f (1789) and its underside. All four are *pyramidea*. Two other figures on the plate are *livida*, a species. Teste Wernbg., *Beitr.*, II, 111, fig. e, has normal marking and outer marginal area lighter but the markings are all of a light reddy-brown; fig. c is a less marked specimen; fig. e is the darkest.

Don., *Nat. Hist. of Br. Is.*, 193 (1798), gave an excellent figure, suffused with blackish, the light markings definite and clear.

Hb., *Samml. Noct.*, 36 (1802), gave an excellent figure with the lighter markings very clear and definite, with dark ground.

Steph., *Illus.*, II, 164 (1829), said "This beautiful insect varies exceedingly: in some specimens the general colour is pale griseous-yellow, with the usual markings; in others of a deep fuscous, with the posterior wings of a dingy copper colour."

Dup. (Godt.), *Hist. Nat.*, V, 136, plt. 56 (136), 4 (1824), gave an excellent figure normal in ground, shading and marking, one may call it typical.

Ochs. & Treit., *Schmett. Noct.*, IV (1), 285 (1825), gave a most useful List of works consulted by them, copies of nearly all of which are in my Library. In fact only 2 authors are wanting. List: Linné; Roesel; Schiffermüller; Illiger; Hübner; Fabricius; Esper; Borkhausen; de Villers; Göze; Geoffroy; Hufnagel; Schrank; Fuessly; Langs; Brahm; Ernst & Engrammelle; Madam Merian; Schwarz; Admiral; Rossi. Only Schrank is wanting and of Hufnagel (*Berlin Mag.*) I have Rottenburg's revision in *Naturforschen*, of which I have a complete run.

Gn., *Hist. Nat. Noct.*, VI, 413 (1852), cited Schiff., *Verz.*; Esp.; Fab.; Don.; Geoff.; Ernst. & Engr.; Godart; Haw.; Hb.; Steph. gave a detailed description of imago and larva. He described as species *pyramidoides* forms from the United States and another race, *l.c.*, 414, *monolitha*, from Silhet. Both are now treated as species.

H.-S., *Bearb. Noct.*, II, 326 (1849), makes no comment, but gave a rather full description.

Stdgr., *Cat.*, IIIed., 200 (1901), included the far Eastern representative *monolitha*, Gn., and *obscura*, Obthr., from E. Asia and Algeria respectively, both of which are now treated as specifically distinct. The *surnia*, Feld., he placed as a Syn. of *monolitha*.

South, *M.B.I.*, I, 323, plt. 154, figs. 1, 2, 3 (1907), gave 3 excellent figures with the following useful description, under the name "the Copper Underwing." "Varies somewhat in the tint of its brown coloured forewings, and in the greater or lesser amount of blackish shading on the central area: the latter is sometimes quite absent and not infrequently the outer marginal area is pale ochreous-brown. The hindwings, normally of a coppery colour, are occasionally paler, and sometimes of a reddish hue." The figures give three grades of colour, shade and marking.

Hampson, *Lep. Phal.*, VII, 48 (1908), cited Linn.; Hb.; Esp.; Don., etc., and as Syns. *monolitha*, Gn.; *surnia*, Feld.; *obscura*, Obth.; *albiquilimbata*, Graes. He recognized *monolitha*, Gn., as an aberration, and described another from Murree, which Strand subsequently named ab. *murrensis*.

Spl., *Schmett. Eur.*, I, p. 238, plt. 44, fig. 28 (1907), gave a very dark figure with more light outer area; the white marking thin and scrappy. Even the hindwings were much deeper in shade. He gave ab. *virgata*, Tutt, the *monolitha*, Gn., and *obscura*, Obthr.; the N. American ab. *pyramidoides*, Gn., was also mentioned.

The name was given from the larva having a conical hump on the back of segment II.

Warr.-Stz., *Pal. Noct.*, III, 158, plt. 38 a (1911), described this species with 4 figures and two new forms, ab. *albiquama*, 38 a, and ab. *variegata*, 38 b, and included ab. *virgata*, Tutt, 38 b. A typical figure was also given. Ab. *monolitha*, Gn., with ab. *surnia*, Feld., as a Syn. and ab. *obscura*, Obthr., were described as good species. Not only did they refer to the United States representative *pyramidoides*, Gn., but to the extreme distribution of typical *pyramidea* and its closely allied species throughout Europe, the mid East, Siberia, the far East, Corea and Japan.

Culot, *N. et. G.*, I (2), 60, plt. 49, f. 9 (1914), gave an excellent figure. He dismisses this species, imago and larva in five lines of text.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 3, 154 (1934), added the following: ab. *fusca*, Rocei; ab. *obscura*, Obthr.; ab. *melaleuca*, Lenz. (compare ab. *albiquama*, Warr.); and ab. *pallida*, Lamb.

Of the Variation Barrett said:—

"Usually only variable in the depth of the brown ground colour of the forewings especially in that portion which lies immediately beyond the second line, which is sometimes of a whitish-brown, and in the depth of the dark band, which in some of the paler individuals is scarcely existent. Sometimes the hindwings are a little paler; indeed, Mr W. H. B. Fletcher possesses a specimen which is almost devoid of the usual copper colour; and Mr Percy Richards has one in which these wings are of a pale bronzy-red quite different from the usual tint. A specimen taken many years ago in the New Forest by the late Mr Baker is of extraordinary and striking beauty; in the forewings its ground colour is intensely dark umbreous, velvety, and glossy, but the orbicular stigma, the margins of the first and second lines and a row of short

streaks along the hind margin are all of a brilliant silvery-white: the hindwings are of the normal colouring."

Tutt gave in *Brit. Noct.*, IV, 37 (1892) (A) a note on all the characters of the species which have been and are available for Variation. (B) He quoted the description by Linn. and (4) described *ab. virgata*, in which the central area of the forewings was beautifully filled with darker colour. (5) He then quoted *ab. obscura*, Obthr., now treated as a var. of the species *monolitha*. (6) Finally he refers to *pyramidoides* from the United States.

The Names and Forms to be considered:—

pyramidea, L. (1758), *Sys. Nat. Noct.*, Xth edn., 518.

pyramidoides, Gn. (1852), *Hist. Nat.*, VI, 413. Sp.

monolitha, Gn. (1852), *Hist. Nat.*, VI, 414. Sp.

magna, Walk. (1865), *Cat. B.M.* Sp. or Syn.

urnia, Feld. (1874). Syn. of *monolitha*.

obscura, Obthr. (1887), *Et.*, V. Ab. of *monolitha*.

albiquilimbata, Graes. (1888), *Berl. e. Zt.* Syn. of *obscura*, Obthr.

ab. virgata, Tutt (1892), *Brit. Noct.*, IV, 38.

ab. pallida Lamb, Lenz. (1908), *Rev. Mens.*, VIII, 48.

ab. albisquama, Warr.-Stz. (1910), *Pal. Noct.*, III, 158.

ab. variegata, Warr.-Stz. (1910), *l.c.*

urnia, Feld. (1914), *Reise. Novar*, plt. 162, 17. Syn. of *monolitha*.

ab. murrensis, Hamp. (1908) [Strand (1915), *Arch. Noct.*, LXXXI, A. 11, 158], *Lep. Phal.*, 29.

ab. melaleuca, Lenz. (1927), *Ostheld. Schm.*, *Sud. Bayn.*, II (2), 311, plt. XI, 1.

ab. lutescens, Cockyne. (1946), *Ent. Record*, LVIII.

ab. insignis, Cockyne. (1946), *l.c.*

ab. melanostigma, Cockyne. (1946), *l.c.*

ab. pallida, Lamb, *Rev. Mens.*, VIII, 48 (1908).

ORIG. DESCRIP.—"Ground of the forewings of a pale burnt-grey, with the ordinary lines well marked in delicate white. The median band not more dark than the ground. Orbicular stigma large, largely bordered with grey-white, a longitudinal black character covering the reniform completely."

ab. albisquama, Warr.-Stz., *Pal. Noct.*, III, 158, plt. 38 a (1910).

ORIG. DESCRIP.—"Has the pale ring of the orbicular, the submarginal line, and the terminal spots brightly white and the outer line more broadly filled up with distinct cream-white; the ground colour uniformly dark brownish-fuscous, obscuring all the horizontal pale markings in the pale vein so that only the transverse lines are visible; thus it resembles the much larger eastern species *monolitha*." Herculesbad, Hungary.

ab. variegata, Warr.-Stz., *Pal. Noct.*, III, 158, plt. 38 b (1911).

ORIG. DESCRIP.—"Has basal half of forewing and the terminal area sprinkled with pale scales and the annulus of the orbicular stigma broadly white." Algeria.

ab. murrensis, Hamp. (1908), Strand (1915), *Lep. Phal.*, VII, 29; *Arch. Noct.*, LXXXI, A. 11, 158.

ORIG. DESCRIP.—“Head, thorax and forewings much redder, the last with the reniform represented by a whitish point, the black suffusion in and beyond cell only prominent and extending to subterminal line.” Murree.

ab. *melaleuca*, Lenz., *Osth. Schm. Sudbay*, II (2), 311 (1927).

FIG.—*l.c.*, plt. XI, 1.

ORIG. DESCRIP.—“Forewing grey-black up to the narrow transverse line; the line before the marginal area shows particularly brighter than that one.”

ab. *lutescens* Ckyne., *Ent. Record*, LVIII, 75 (1946).

ORIG. DESCRIP.—“The forewings and thorax are paler than usual, and the copper colour of the hindwings is replaced by shining creamy yellow.”

Type: ♂, Tremaine, Cornwall, 23.viii.1932; C.W.W.H., H. B. D. Kettlewell Coll.

ab. *insignis*, Ckyne., *l.c.*

FIG.—plt. I, f. 9.

ORIG. DESCRIP.—“The ground colour of the forewing is bone coloured and the only markings are the black postmedian line bordered internally by blackish-brown to form a dark transverse band, the black stripe joining the postmedian to the inner half of the reniform, the blackish-brown ring and central dot of the orbicular, the line joining it to the antemedian, and the antemedian line itself.”

Type: ♂, Lydart, Monmouth, 1941. At sugar; Sir Beckwith Whitehouse.

ab. *melanostigma*, Ckyne., *l.c.*

ORIG. DESCRIP.—“Thorax paler than usual, the ground colour of the forewing as far out as the sagittate marks, which lie just internal to the subterminal line, is very pale ochreous-brown; the light transverse lines are lost in the ground colour. The antemedian is represented by three blackish-brown dots, the postmedian by a row of blackish dots, and the orbicular by a black dot. The discoidal spot and the dark streak running from it to the postmedian are blackish-brown and very conspicuous.”

Type: ♂, Brampton, Hants. Bred 1.ix.1925; G. Raynor.

Figured *Proc. South Lond. Ent. and N.H. Soc.*, 1937-1938. Pl. 2, fig. 4.

pyramidoides, Gn., *Hist. Nat.*, II, 113 (1852).

ORIGINAL DESCRIPTION:—It is extremely near our *pyramidea*, from which it differs by very slight but constant characters, which are as follows: The肘ed line, instead of taking a turn at the top end and so causing a sinus in the cell, is a straight course and runs off obliquely; it bounds a median space which is almost uniformly darker and in which the black median shade is absorbed. The clear lines are generally straighter and the subterminal more continuous to the top, there bounding a clear external area.” (The third joint of the palpus is longer and more pointed.) U.S.A. Seitz figure has much too bright an orange-red lower wing.

FIG.—Seitz, VII, *Fn. Am.*, III, plt. 30 a.

All the marking more decided and definite in fig.

Amphipyra tragopogonis (onis), L.*Amphipyra*, Ochs. & Treit. (1816). Most authors.

Clerck's, *Icones*, I, No 5 (1759), is a figure of *tragopogonis*, and at that period was treated as their type, i.e. before the 1758 issue of Linn.'s *S.N. Sys. Naturae* was taken as the date of the type.

Hufn., *Berl. Mag.*, III, 294, No. 40 (1766), *luciola*, of which he gave the DESCRIPTION: "Glossy grey-brown with 3 small blackish spots on each forewing."

Rottenbg., *Naturfr.*, IX, 155 (1776), said it was undoubtedly the *tragopogonis*, Linn.

Ernst & Engram., *Pap. d'Eur.*, VI, 99, f. 338 a, b, c (1789), gave 3 good figures: a and c upper, c under. They called it the *Tragopogoa*. They cite Fab., *Syst. Ent.*, 65; *Sp. Ins.*, II, 337; *Mant.*, II, 177; de Geer, *Mem.*, II (1), 418; Frisch., *Ins.*, II, 33.

Esp., *Abbild. Noct.*, IV, 622, plt. 170, f. 1-2 (1791+?), gave 2 recognizable figures of *tragopogonis*. Teste Wernbg., *Beitr.* (1864).

Hb., *Noct.*, plt. 8, f. 40 (1800), gave a good very dark figure under the mis-spelt name *tragopognis*.

Haw., *Lep. Brit.*, 164 (1809), described a British example "Murina lata. Alae anticae punctis tribus fuscis contiguas ut in praecedente primo in loco signatis antici duobus aliis transversis loco stigmatum postici. Alae posticae ut in priore ut multo pallidiores."

Godt., *Hist. Nat.*, V, 145, plt. LVII, f. 3 (1824), gave 2 good figures, one of *tetra*, Fb. (nec Haw.).

Treit., *Schmett. Noct.*, V (1), 27 (1825), cited Ernst & Engram., *Pap. d'Eur.*, VI, f. 338; Hufn., *Berl. Mag.*, III, 294, No. 40, *luciola*; Rott., *Naturf.*, IX; Schiff., *Verz.*, 95, Q. 14; Illig., *Rev. Verz.*, I, 295, and *Mag.*, II, 118; Göze, *Beitr.*, III (3), 173; de Geer, II; Esp., *Abbild.*, IV; Bork., IV; de Vill., II; Fuessl.; Rossi; Clerck; Linn.; Hb., etc. [Hb. wrote the name *Tragopognis*.]

Steph., *Ill.*, II, 164-5 (1829), created the genus *Pyrophila* for the 2 species *tragopogonis*, L., and *tetra*, Haw., the latter the form taken in the S.W. of England and so described by Haw. and not to be confused with the Southern European *tetra*, Fb.

An idea arose among early entomologists that *tragopogonis*, L., was a form of *pyramidea* no doubt on account of the description of the many allied forms and species obtained over the northern hemisphere. But with the discovery of the larvae it was proved that the two species were quite distinct and the more recent investigation of the genitalia has helped to complete the clearing of all the allied forms and species.

The larvae (full-fed) were figured on plate CIII, f. 2, 2a, 2b, *pyramidea*, and 3, 3a, 3b, *tragopogonis*, in the Ray Society's *Larvae* (1895).

Stdgr., *Cat.*, 200 (1901), included Grote's *repressus* from Canada as a Syn., and quoted his own ssp. *turcomana*, *Stett. e. Zt.* (1888), p. 32 (pallidior, al. ant. plumbeon [lutescente] grisescentibus). He corrected *gins* to *gonis* of *Tragopogon*.

Spl., *Schmett. Eur. Raupen.* (1903-8), gave equally good and distinctive figure on plt. XXX, f. 12, *tragopogonis*, and f. 14, *pyramidea*.

Spl., *Schmett. Eur.*, I, 237 (1906), pointed out that the name *tetra* had been applied to two separate but very closely allied forms or species: (1) *tetra*, Fab., a southern, larger species described as blackish-grey;

(2) *tetra*, Haw., also blackish-grey. The former having a reddish tinge. Splr. substituted the name *nigrescens* for the *tragopoginis* British form.

Spuler also pointed out the spelling *tragopoginis* was an error. *Tragopogon* was the foodplant of the larva and therefore the name should end with *onis* and not *inis*, *tragopogonis*.

Hamp., *Lep. Phal.*, VII, 35, f. 6 (b. & w.) (1908), referred to Clerck, *Icones*; Godart, *Hist. Nat.*, V, 145; Smith, *Cat. N. Am. Noct.* He cited *luciola*, Hufn.; *repressus*, Grote; and *turcomana*, Stdgr. He quotes ab. *turcomana*, Stdgr., "Paler, forewing leaden-grey with a yellowish tinge."

Warr.-Stz., *Pal. Noct.*, III, 159, plt. 38 d (1911), gave good figures of the type ssp. *turcomana*, 38 e. They treated *tetra*, F. (nec Haw.), as a sp., with its ab. *pallida*; ab. *luciola*, Hufn., as a Syn.; form *repressus*, Grote, as a Syn. ab. *tetra*, Haw. nec F.), is a Syn. of ab. *nigrescens*, Splr.

Pierce says, *Genit. Noct.*, 78 (1909), *A. pyramidea*—Harpe simple, without armature, the apex thickly clothed with strong hairs; uncus broadens to a pointed bulb at the tip; vesica with a bunch of long teeth or spines.

A. tragopogonis—Harpe with an undivided cucullus broader and rounded, thickly clothed with hairs, clasper a short bulbed arm; clavus just raised; uncus broad; vesica with a bunch of long teeth or spines of irregular thickness.

Culot, *N. et. G.*, I (2), 59, plt. 49, f. 5 (1914), gave a very good typical figure. He wrote, "Very near to the next species (*tetra*, F., nec Haw.) but always larger, almost always more distinct, with the ordinary spots present, while they are lost in the deep colour of *tetra*, F. The hindwings are also less coppery in *tragopogonis* than in *tetra*, although some examples of *tetra* have them less red."

Drdt.-Stz., *Pal. Noct. Supp.*, III, 155 (1934), reported ab. *brayi*, Lamb, a melanic form; ab. *grisea*, Vorb.; ssp. *distincta*, Roths., large and very distinctly marked. Algeria.

Tutt dealt with the possible variation, the depth of the ground colour, the reniform represented by two unstable dots, and the orbicular represented generally by a short oblong dot. The form which was slightly darker was called *tetra* by Haw., possibly confused with the Continental species of that name. Tutt gave the description by Linn., *Fn. Suec.* He discussed this form at some length, quoting the remarks of Humph. & Westwd., Guenée, and Doubleday.

Of the Variation Barrett said:—

"Variation in this species is but slight—a small degree of darkening of the ground colour or of its being paler; specimens of a pale silvery-grey are in the collections of Mr Sydney Webb and Mr P. M. Bright; and one very nearly black was taken by Major Still on Dartmoor."

The Names and Forms to be considered:—

tragopogonis (*ginis*), Linn. (1761), *Fn. Suec.*, 316.

ab. *luciola*, Hufn. (1766), *Berl. Mag.*, III, 294, No. 40. Syn.

tetra, Haw. (1809), *Lep. Brit.*, 164. Syn.

race *repressus*, Grote (1871), *Can. Ent.*, 192.

ssp. *turcomana*, Stdgr. (1888), *Cat.*, 200.

ab. *nigrescens*, Splr. (1906), *Schm. Eur.*, I, 237.

ab. *brayi*, Lamb (1907), *Rev. Mens.*, 29.

ab. *distincta*, Roths. (1921), *Nov. Zool.*, XXVII, 90.

ab. *grisea*, Vorbrt. (1921), *Mitt. Schw. Ent. Gess.*, XIII, 190.

ab. *demaculata*, Nordstr. (1939), *Svens. Fjårl.*, 167.

ab. *luciola*, Hufn., *Berlin Mag.*, III, 294, No. 40 (1766).

ORIG. DESCRIP.—“Glossy grey-brown, with 3 small blackish spots on each forewing.”

Rottenbg., *Naturfrchn.*, IX, 115 (1776), said it was *tragopogonis*, Linn. [*tragopoginis*, Linn.].

race *repressus*, Grote, *Can. Ent.*, III, 192 (1871).

ORIG. DESCRIP.—“Unicolorous pale testaceous or greyish-brown. Forewings and thorax concolorous; the first are without markings except a short dark dash on the cell in place of the orbicular, and two similarly superposed marks at the extremity of the cell, in place of the reniform spot. Three pale ante-apical dots on costa. Veins sub-obsolete marked with darker scales. Secondaries pale with a testaceous tinge, darker shaded outwardly. Beneath paler, powdered with greyish and brownish scales; faint traces of discal marks. Squamation lustrous, silky.” Canada.

race *turcomana*, Stdgr., *Stett. e. Zeit.*, 32 (1888).

ORIG. DESCRIP.—“The *tragopoginis*, found about the end of May, obtained in great numbers in the province of Samarkand, as well as specimens agreeing with them from Margelan and Tekke, differ so notably from typical specimens by a far lighter colour, that they deserve a varietal name. The forewings are shining light blue-grey instead of dark brown- (blackish) grey; the three dark points in and at the end of the middle cell appear quite obsolescent, while the dark obsolescent shaded band before the outer margin is only slightly apparent in odd specimens. The hindwings of this var. are also far lighter, with white-yellowish fringes which carry a darker lining.”

ab. *nigrescens*, Splr., *Schm. Eur.*, I, 237 (1906).

ORIG. DESCRIP.—“Blackish-grey ground,” with no tint of gold and it was somewhat smaller.

ab. *brayi*, Lamb, *Rev. Mens.*, 29 (1907).

ORIG. DESCRIP.—“It is a melanic form of much beauty suggesting the colour of *A. lurida*; the forewings are of a deep black, evenly allowing the ordinary spot to show, as they are lost in the ground colour. The hindwings are also sensibly darker than in the typical form.” Virton, Belgium.

subsp. *distincta*, Roths., *Nov. Zool.*, XXVII, 90 (1921).

ORIG. DESCRIP.—“Larger and more brightly coloured. Head and thorax deep black-brown; abdomen smoky wood-brown; palpi and antennae black. Forewings basal three-fourths deep black-brown, powdered with dark grey, orbicular represented by a black spot or streak and reniform by two black spots; outer one-fourth sooty blackish-grey. Hindwings rusty wood-brown washed with sooty-grey.” Algeria.

ab. *grisea*, Vorbr., *Mitt. Schw. Ent. Gessl.*, XIII, 190 (1921).

[Drdt., *Pal. Noct. Supp.*, III, 155 (1934). DESCRIPT.—“A pure grey form from Switzerland.”]

ab. *demaculata*, Nordstr., *Svens. Fjarl.*, 167 (1939).

ORIG. DESCRIPT.—“With the three stigmata wholly wanting.” Sweden.

ADDITIONS TO VOL. I.

To *E. matura*, p. 284, add:

ab. *wahlgreni*, Nordstr., *Sven. Fjarl.*, 180 (1940).

DESCRIPT.—“Ground colour light brownish, lighter than in the typical form.”

An ab. of var. *radiata*, Welgm.

To *A. rumicis*, p. 74, add:

ab. *lepida*, Wherli., *Scott. Nat.*, II, 178 (1873).

ORIG. DESCRIPT.—“Usually rather smaller than the typical form; wing darker; usually nearly unicolorous.” *Stainloris Man.*, I, 183, as *A. salicis*; the description of the larva is that of *menyanthis*, Newman. *Brit. Moths* figured it p. 255.

To *M. strigilis*, p. 228, add:

ab. *amoena*, Krlkvski., *Soc. Ent.*, 21, 11 (1908).

ORIG. DESCRIPT.—“The waved band shows a greenish tint.”

To *L. elymi*, p. 127, add:

ab. *renifera*, Nordstr., *Sven. Fjarl.*, 192 (1940).

DESCRIPT.—“Forewings have a recognizable reniform stigmata.”

To *l.c.*, add:

ab. *defundata*, Nordstr., *Sven. Fjarl.*, 192 (1940).

DESCRIPT.—“With the two lines of black points absent.”

CORRECTIONS (to p. 56).

APPENDIX TO VOL. I.

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ab. *wahlgreni*, Nordstr., *Sven. Fjard.*, 180 (1940).

DESCRIP.—“Ground colour light brownish, lighter than in the typical form.”

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To *T. elymi*, add:

ab. *defundata*, Nordstr., *Sven. Fjard.*, 192 (1940).

DESCRIP.—“With the two lines of black points absent.”

Mania maura, Linn.

Mania, Tr. (1825). Most authors. [*Mormo*, Sam. (1829) Stephens (Hb., Verz., 275); *Hadena*, Treit. (1802), Mer. (1815)], *maura*, Linn.

The two species, *maura* and *typica*, have apparently no direct association together and are a constant enigma to all our systematists.

Schiff., Verz., 90, X, 1 (1775). The dark olive-brown Noct., *N. maura*, L.

Illiger, *Neuer Gegend Verz.*, I, 333, 1 (1801), cited Lin., Fab., Bork., and Esper.

Moses Harris, *English Insects*, p. 1, plt. I, f. 1-2 (1782), gave 2 b. and w. figures, dark British form, quite good, with a note of its life history.

Esper, *Abbild. Noct.*, IV, 165, plt. CVII, 1 (1789+?), gave a figure of the *lemur* (Naturfr.) type, but differing in the placing of the markings. The black veins were very complete on all four wings, and con-

spicuous on the brown-black ground, i.e. the whitish band is continuous across both fore and hindwings.

On the costa of the forewings the 6 deep black blotches show clearly with lighter grey ground between. So often they are almost or wholly swallowed by the depth of the black ground. The apical blotch is fairly strong; the marginal narrow band is also lighter on all four wings; of the irregular surface scratching, there is neither so much or so apparent as in usual specimens.

Ernst & Engram., *Pap. d'Eur.*, VIII, 60, f. 561 c-h (1792), gave 6 excellent figures.

c is grey-black. It is lighter on the forewings near the body and along the border of costa wing, as far as the middle; these parts are marked with black spots; the remainder is traversed by wavy black lines and blackish bands, some detached from others by intervening clear areas. The hindwings have in the centre a small grey streak; their outer margin is less dark than the rest of the wings.

d, an underside, is blackish. The grey wings are traversed by a small grey ray and their outer margin is of the same colour.

e is a male variety of less colour tone and more uniform, in which all the spots are very slightly indicated.

f has the ground less suffused with black and the light portions are more extensive. The margin of the lower wing is whitish, having for each segment, spots largely formed by the black points (specks) near a chevron upon a grey ground.

g. The underside is much paler than that of the male. The adjoining band and the outer margin are more whitish. Each wing bears a black crescentic character which is equally indicative of a male, but of which there is less apparently, because of the deeper blackish ground, that of the hindwing is double.

h is the figure of a female variety remarkable for the fulvous-red of all the paler portions of the forewings which make it very prominent. Its upper side is like that of *g*.

Hübner, *Noct.*, 326 (1800-03), was a very good figure of a light form, a female, with all the markings of the species in light grey, not emphasised, except the thin white scratchy lines. The central area of the forewing was deep black rather contracted in area.

Godart. (Duponchel), *Hist. Nat.*, V, 108, plt. LIV, f. 1-2 (1824), gave two very good figures, large, good and very dark. The ground of the forewings was largely deep black; the usual lighter areas, outer margin, apex, were irregularly marked with mottling of greyish-black, the stronger feature, stigmata remnants, hindwing band were whitish-grey. The small thin scratchy markings were in part white on the dark ground. He stated that Linn. received the species from Mauretania. He cited the genus *Mormo*, Ochs., and *lemur*, Naturfr.; Moses Harris.

Treit., *Schmett.*, V (1), 295 (1825), gave a long description and life-history. He referred to Schiff., *Verz.*, 90, X, 1 (1775); Illiger, *Rev. Verz.* (N. Ausg.), I, 333 (1801); Esper, *Schem. Abbild.*, IV, 165, plt. CVII, 1: De Vill., *Ent Linn.*, II, 211: Göze, *Ent. Beitr.*, III, 120: Ernst & Engram., *Pap. d'Eur.*, VIII, 59, fig. 561: Bork., *Nat.*, IV: Schaffer., *Icones*, I, 5-6, plt. 1: Harris, *Eng. Ins.*: Rossi, *Mant.*, II: etc.

Frr., *Beitrag.*, II, 24, plt. LIII (1829), gave a figure of the *lemur* form of *maura* in general appearance but with variation of the relative position of the markings. The white markings were not so pure as in the typical figure *lemur*, *Naturf.*, but contrast with the black ground. The black veins are very strong against the brown-black ground on all four wings. The whitish marking around the stigmata are squared up between two parallel longitudinal white lines.

Stephens, *Illust.*, III, 130 (1830), could not associate *Maura* with the other drab species in the genus *Mania*, Ochs., adopted the *Mormo*, Ochs. He objected to both *Mania*, Ochs., and to *Naenia*, Ochs. The characteristics of *maura* seemed to be the least in the scratch marking.

Newman, *Brit. Moths*, 460 (1869), gave 2 good b. and w. figures, one an average British ♂, the other lighter called "ab." is probably a ♀. The latter shows the veins quite clearly. The Edition is the original and not the reprint with worn wood blocks.

Meyr., *Handb.*, 129 (1895), used the genus *Hadena*, and well dissociated from *typica*.

In his *Revised Handbk.*, 78 (1927), he used the genus *Mania*, Treit., for this species alone and followed immediately by *Hadena*, and preceded by the genus *Caradrina*.

Spuler, *Schmett. Eur.*, I, 212, plt. XLI, 28 (1917), gave a good figure, ♂. He said that there were two forms, one with either sulphur-yellow-ochre marking or suffused reddish-yellow-brown with dark central area of forewings shining clearly.

This latter is Gn.'s Var. A; Tutt names this *rosea*, and states that he has never seen it; since this Var. A is so common as Gn. states, then I must suppose that Tutt has put forward another form than the common one among Gn.'s Var. A, as I understand it here; that the name *rosea*, Tutt, is put forward for a non-existing form. If it has no validity one may none the less apply the name *rosea* mihi with the above-mentioned characteristics.

The ab. *striata*, Tutt, represents a sharply ochre-yellow marked extreme of the type, which occurs only rarely.

South, *M.B.I.*, I, 292, plt. 142, f. 1, ♂; f. 2, ♀ (1907), gave two excellent figures of average British forms, but specimen marked female is rather lighter than usual.

Hamp., *Lep. Phal.*, VII, 50, fig. 11 (1908), gave a good fig. (b. and w.). He recorded *lemur*, Meinecke (1775), *Naturfr.*, VI, 112 (1775).

Culot, *N. et. G.*, I (1), 203, plt. XXXVII, f. 9, ♀ (1913), said the ♂ was more or less invariable in the deep brown colour, while the ♀ was subject to considerable variation, generally lighter, and recognised the ab. *striata*, Tutt. Culot gave two excellent figures.

Warr.-Stz., *Pal. Noct.*, III, 126, plt. 39 b (1911), treated of the typical form with *lemur*, Meineck., and *virgata*, Tutt, as Syn. They accepted the ab. *striata*, Tutt, 39 b. A lighter form.

Of the Variation Barrett said:

Not very variable, though some examples have the black portion of the central band very *velvety*-black, contrasting well with the paler lines and shades; and these usually have the apical patch of the forewings and the marginal stripe of the hind more yellow-brown, and the latter expanded into dashes on the nervures. On the other hand, some

specimens are extremely dull and uniform in colour. In South Yorkshire the blackening effect observable in so many species is conspicuous in this, the other half of the hindwings being usually black, some examples furnished by Mr G. T. Porrit are extremely sombre, on the other hand, has all the paler markings of a really bright yellow-brown, strongly contrasting with the black ground, and is a magnificent specimen.

Tutt quoted the diagnosis of *maura*, L., from the *Syst. Nat.*, Xed. (1758). This was a short and insufficient description. The species did not occur in Sweden. In the XIIth and XIIIth edns. the diagnosis was amplified—"Alis depressis dentatis, fasciis duabus nigris; inferioribus nigris fascia alba." + "Alae postice dentatae, superiores luridae, costae margine sexies nigro; inferiores & superiores subtus fascia transversa angusta pallida; praetereanmargo posticus terminatus subtus fascia lata albida."

Linn. now cited 2 figures of *maura* published in Schaeffer's *Icones* (1764), plate I, f. 5-6. Thus we get a definite type figure that can be compared with other suggested type figures. These figures are not good and are small and dark.

These two figures of Schaeffer's *Icones* are before me and show all the marking noted in the later Linn. description. Besides the transverse lines and fasciae, which are indefinite, there are many additional whitish or almost white fine lines along the venation and both figures have the dark central area black on a black ground spreading to the base. I have *maura* from many British sources, but none of the type shown by Linn. and Shaeff.

In Tutt's summary of the forms, he writes that the Linn. type is "Almost unicolorous." A very misleading statement. He quotes Newman figures, *British Moths* (1870), p. 460 (1st edition). Nor is the ground colour unicolorous.

The Forms and Names to be considered:

maura, L. (1758), *Syst. Nat.*, Xth, 512.

ab. *lemur*, Meine. (1775 ?), *Naturfr.*, VI, 112, plt. V, 1.

ab. *virgata*, Tutt (1892), *Brit. Noct.*, 40.

ab. *striata*, Tutt (1892), *l.c.*

ab. *rosea*, Tutt (1892), *l.c.*

ab. *obscura*, Splr. (1906), *Schmett. Eur.*, I, 212.

ab. *oicoviensis*, Brezanko (1924), *Arch. Natg.*, XC, A.5, 241, fig. 1.

ab. *maurisca*, Stdgr. (1928), *Bdsch. Wien*, 2.

Tutt dealt (1) with the "almost unicolorous" *maura*, Linn., (2) named the form "with the central area banded," ab. *virgata*, (3) named the form "with pale (whitish) transverse and longitudinal lines," var. *striata*, (4) named the form "tinted with rosy or violet," ab. *rosea*. Surely quite definitely non-related colours.

In *Naturfr.*, VI, 112 (1775), Mein. described this (?) species under the name *lemur* and gave a very good fig. in plt. V, fig. 1, showing what is the usual ? continental form.

Showing the white colour basis as very clear markings. This fig. looks as if all the brown-black colour has been laid on a clean white ground and then been scratched over by a sharp pencil in great contrast to the form with all but a few "scratches" and definite and widely suffused with indefinite grey.

ab. *lemur*, Meine., *Naturfr.*, VI, 112, plt. V. f. 1 (1775)—Descrip. of fig.—The general remark on this form is the striking contrast between the purity of the white marking however slender and the extent of black (not brown) ground. It would seem that deep black colour had been spread on a pure white basal surface, that the black was then scratched over by sharp pointed instruments of various sizes producing the various markings with very definite edges; that the usual lighter band like areas are run over by a small cut down paint brush in an irregular manner producing a grey surface just appreciable.

The most conspicuous feature is a very prominent medial white narrow band on the hindwing, in no way suggestive of continuance on the forewing. The outer marginal transverse line is much narrower but not followed by such a line on the hind wing. The orbicular and reniform are both present, the former much fattened with a narrow black centre, the latter more shapely with a dark grey centre: both outlines in clear white. Costal blotches not developed. Transverse black lines swallowed by the deep black ground.

ab. *obscura*, Splr., *Schmett, Eur.*, I, 212 (1906) (referred to the two main forms, described the characters of the type form, and after the word "order" gave the characters of the other form which he subsequently called *obscura* in a footnote).

DESCRIP.—This is a reddish-yellow-brown suffused form, with the dark central area of the forewing extending back to the body distinctly glossy.

ab. *oicoviensis*, Brezanko, *Arch. Natg.*, XC, A.5, 241, fig. (1924).

DESCRIPTION.—"Has only a very pale apical spot, the pale transverse lines are almost obsolete, there is a pale band anteriorly with a dark band parallel outwardly in central area." Poland. [*Pal. Noct. Supp.*, III, 158, Drdt.]

ab. *maurisca*, Stauder., *Lep. Rundsh.*, II, 115 (1928), Wien.

DESCRIPTION:—"Is a mountainous dark black form without any brownish sheen. All pale markings are absent except the margin of hindwings and the narrow discal band." Sicily. [*Pal. Noct. Supp.*, III, 155, Drdt.]

Naenia, Steph., *typica*, L.

Naenia, Steph. Many authors. [*Agrotis*, Ochs., Meyr. (1): *Graphiphora*, Ochs., Meyr. (2): *Mania*, Tr. (1825), a few authors] *typica*, Linn. (1758).

Hufn., *Berlin Mag.*, III, 290, No. 34 (1766), *typica*.

DESCRIP.—"Graubraun, met unen nierenformigen dunkeln Fleck, und netzgormigen blass-gelben strichen."

In 1895 Meyr. dissociated *typica* from *maura*, placing it the last of a long list of *Agrotis* species. In 1928 (2) Meyr. used the Genus name *Graphiphora*, Ochs. No doubt *maura* and *typica* were early classified in close association from the extreme similarity of the markings and ground colour. (Hy. J. T.)

Göze, *Beitr.*, III (3), 180, No. 186 (1781). He gave descriptions from the *Fn. S.* of Linn and from Hufn., *Berl. Mag.*

Rosel., *Ins. Belust.*, I, plt. LVI (1746), gave two very good figures in which the net-like white scratchy markings were somewhat more pronounced than usual. It was quoted by Linn. in *Fn. S.*

Schiff., *Verz.*, p. 82, O.4(1775), *typica*.

Illiger., *New. Ausg.*, 210. He cited *Fn. Suec.*; Fb., *Ent. Sys.*, III; Brahm, *Ins. Kalend.*; Esp., *Abbild. Noct.*, IV, and described the larva,

Ernst & Engram., *Pap. d'Eur.*, VII, 461 c, d, e, p. 77 (1791), gave three very good figures. An underside of both ♂ and ♀, c and d are two upper sides. Upperside ♂ and ♀ differing very slightly. They cite Linn., *Sys. Nat.*, XII (XIII) as usual on p. 857 (1767); *Fn. Suec.*: Schiff.; Rösel.; Fab.; Müllen.; Fuessly.; Hufn.; Göze. Harris (wrongly).

The markings of *typica* vary so slightly that the variation lies in the ground shades expressed in the named aberrations, and the markings are of the net-like general characters of *maura*, but rarely is prominent.

Treit., *Schmett. Eur.*, V (1), p. 298 (1825), gave a good description and cited more than 20 authors works, including Hb., *Samml. Noct.*, fig. 61 (1800-1803), under the name *venosa*; Schiff., *Verz.*, 82, O.4 (1775); Fab., *Ent. Sys.*, III, 2; Bork., *Eur. Schmett.*, IV, 402; Esper, *Abbild.*, IV, plt. CLXXIII, 1-3, p. 448; De Vill., *Ent. Linn.*, II, 244; Hufn., *Berl. Mag.*, III., p. 290, No. 54; Mull.; Rösel.; Fuessl.; Göze; Ernst & Engram., *Pap. d'Eur.*, VII, plt. CCLXXXI, fig. 461, p. 477; Schwarts.

Dup., *Hist. Nat. Lep.*, VI, 269, plt. 90, 1 (1826), gave a figure with two intensely black areas, one inside the reniform, the other, the smaller, between the two stigmata.

Gn., *Hist. Nat.*, VI, 417 (1852), used the Genus *Mania* for *typica*, but no description. He cited de Geer, II, 441, plt. 7; Schiff.; Haw.; Treit.; Bork., Rossi; Dup.; Ernst & Engr.; Steph.; Bdv.; and *venosa*, Hb.

Hamp., *Lep. Phal. Nat.*, IV, 619, 111 (1903), gave a good figure somewhat too conspicuous marking. Noted *excusa*, Esp.; *vena*, Hb., and *issyka*, Pung. (altered c to k). In his description of which he used c.

Splr., *Schmett. Eur.*, I, 212, plt. 21, f. 28, gave a figure of which he said the markings were not distinctly brought out. He described a new form *obscura*, and reported the ab. *brunnea*, Tutt.

The ♂ is more uniform than the ♀, which is more usually darkened red-brown. Rarely with us, more frequently in the North do the transverse lines of the ground colour of the ♂, as well as the orbicular and reniform, become dusted with violet suffused black scales.

Warr.-Stz., *Pal. Noct.*, III, 62, plt. 149 (1909), treated *excusa*, Esp., and *venosa*, Hb., a Syn.; included race *issyca*, Pung., from Issykkul; and ab. *brunnea*, Tutt. The ♂ figure is very dark with thin marking; the ♀ figure is unusually light generally.

Culot, *N. et G.*, I, 203, plt. 37, fig. 10, ♂, good. ♀ "similar." He notes that this species varies considerably as does *N. maura*, in colour, shade and marking. He recognized *venosa*, Hb.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 89 (1934), reported two forms, ab. *claricolum*, Schaw., a very pale ochreous, and ab. *contaminatoides*, Schaw., finely coloured with pale yellow, very similar to a species *N. contaminata*, Vol. III, plt. 14 g.

Of the Variation Barrett said:

Variable in size and also in the blackness of the interspaces in the middle basal area of the forewings, beyond this usually pretty constant; but in S. Yorkshire Mr G. T. Porritt has obtained two very curious forms; otherwise, sharply marked, has black blotches on the inner edge of the subterminal line, and the first and second lines altered into broad stripes of a rich pinkish-white colour united on the dorsal margin; the other, of which several were reared, is quite abnormal, yet not in any way crippled, the forewing being broadened and shortened in a most extraordinary manner, until the breadth from the apex to the anal angle very nearly equals the length; the pattern of markings is also broadened, and in some specimens very sharp and distinct, in others obscured by smoky-brown colour; the hindwings are shortened and expanded in the same proportion. Another singular specimen, in the cabinet of the Rev. Joseph Greene, has the white lines on the nervures of the left wing obliterated except two short pieces near the apex, the white margins of the stigmata and transverse lines being also absent, and the greater portion of the wing dull brown; but the right wing has the white markings of the dorsal portion beyond the middle alone obliterated.

Tutt had very little to say about this species. He quoted the initial description in Linn., *Sys. Nat.*, Xth, p. 518 (1758), and Linn's second description in *Fn. Suec.* (1761), p. 317, and then he named the form with a deep ochreous ground ab. *brunnea*.

List of Names and Forms to be considered:

typica, Linn., *Sys. Nat.*, Xth, 518 (1758).

Syn. *excusa*, Esp. (1790+?), *Abbild Noct.*, IV (2), p. 70, plt. CXC VII, 1-3.

venosa, Hb., *Saml.* (1800-1803). Syn.

ab. *brunnea*, Tutt (1892), *Bri. Noct.*, IV, 40.

race *issjca*, Pung. (1891) (1900) (1903), *Iris*, XIII, 119.

ab. *obscura*, Splr. (1906), *Schm. Eur.*, I, 212.

ab. *clausa*, Lempke (1939), *Tijds.*, 232.

ab. *confluens*, Lempke (1937), *l.c.*, 233.

ab. *albilinea*, Ckyne. (1942), *Ent. Rec.*, LIV, 14, plt. II.

ab. *claricolor* (1934), *Pal. Noct. Supp.*, III, 89.

ab. *contaminatoides* (1934), *l.c.*

ab. *excusa*, Esp., *Abbild Noct.*, IV (2), p. 70, plt. CXC VII, 1-3 (1789?).

DESCRIPTION—Wernebg., *Beitr. Schmett. Kunde.*, II, 53 (1864). A rare variety with coppery-brown ground colour, almost as in *N. triangulum* but not to be mistaken, for in fig. 1 between the outer line of the reniform and the marginal bands of the forewing there stands a black spot that is not present in *triangulum*. *Typica*, fig. 2, lacks the black marking in the centre of the upper forewing of *triangulum*.

ab. *issyca*, Pung., *Iris*, XIII, p. 119 (1892) [Warr.-Stz., *Pal. Noct.*, III, 62].

DESCRIP.—“Redder, and has the termen less crenulate.” Issykkul.

ab. *obscura*, Splr., *Schmett. Eur.*, I, 212 (1904), referred to two basic forms.

ORIG. DESCRIP.—(1) Rare; is more frequently in the North form, with transverse lines of the ground colour of the ♂, (2) as well as the form with the orbicular and reniform have become dusted with violet suffused scaling.

ab. *clausa*, Lempke, *Tijds.* (1939), 233.

ORIG. DESCRIP.—“The first and second transverse lines converge to a point on the inner margin.” Holland.

ab. *semiconfluens*, Lempke, *Tijds.* (1939), 233.

ORIG. DESCRIP.—“The two stigmata are united by a double line, the encirclement of both being broken.” Holland.

ab. *albilinea*, Ckyne., *Ent. Record*, LIV, 14, plt. II (1942).

FIG.—*l.c.*, plt. II, 10.

ORIGINAL DESCRIP.—“There is a great increase in the white in the median band, external to the antemedian and internal to the post-median from nervure 4 to the inner margin where these two white stripes unite and also along its costa. In others respects the moth is normal.”

Type, female. Chelford, Cheshire, 26.vii.30. E. Aubrook. Crabtree Collection (fig. 10). There is a similar specimen taken in S. Yorkshire by G. T. Porritt, figure in Barrett, *Brit. Lepidoptera*, Vol. V, plt. 217, fig. 1 c.

ab. *claricolor*, Schaw., Drdt.-Stz., *Pal. Noct. Supp.*, III, p. 89 (1934).

DESCRIP.—“A very pale ochreous-yellow form, and surrounds to stigmata heavily marked with pale yellow. Only the triangular mark in basal area, patches each side of the stigmata and in front of the apex are darker.”

ab. *contaminatoides*, Schaw., *l.c.*

DESCRIPTION.—“Colour is with blackish marking. Stigmata finely outlined with pale yellow, very similar to a previous species, *N. contaminata*, Wlkr. (*Pal. Noct.*, III, 62, plt. 14). Described from Mostar.

The Genus *Asticta*, Hb.*A. pastinum*, Treit.*A. cracca*, Fab.

The two species *pastinum* and the purely English and very local *cracca* seem to have caused a deal of trouble to all our systematists.

Tutt gave a few lines of introduction to the purely English and very local species *cracca*. In his notes on *pastinum* he stated that it was very common (*Brit. Noct.*, p. 42). This statement does not agree with the experience of other entomologists.

So far as Tutt and myself were concerned *pastinum* was a species met with in a chalk district. My series was taken in a valley at the rear of Box Hill on various visits. Tutt lived at Srood in Kent in the midst of a small area where they were found in plenty hiding in rough grass. Such areas are full of cracks giving additional shelter.

Hampson, in his 13 volumes of *Lep. Phal.*, made no reference to either of them, but in 1926, in a *Supp.* to *Lep. Phal.*, there were printed a few lines he had containing references leading up to *pastinum*, of which the following is a copy:

Genus *Asticta*, Hb.

Ophiusa, Ochs., *Schmett. Eur.*, IV, 93 (1816), non-descrip. Treit., *Schmett. Eur.*, V, (3), 288 (1826), nec L., 1818, *lusoria*, L.

Asticta, Hb., *Verz.*, 266 (1827). *proca*, Hb.

Ophiusa, Hb., *Verz.*, Hb., 266 (1827). *lusoria*, Hb.

Toxocampa, Gn., *Ann. Soc. Ent. Fr.*, 1841, p. 75. *pastinum*, Treit.

Toxocampa, Gn., *pastinum*, Tr.

Toxocampa, Gn. (1852). Most authors. [*Ophiusa*, Hb. (82): *Eccrita*, Led. (1857), *Splr.*] *pastinum*, Tr. (1825).

The specific nomenclature of this species is in doubt. Treit gave no remark or suggestion although his knowledge of author and species was profound. Warr.-Stz. omitted all research and Drdt.-Stz. did not even mention the species. It was my intention to omit this and to give full references and omit details and discussion.

Warr.-Stz., *Pal. Noct.*, III, 373, plt. 68 f. (1913), in recording the genus *Ophiusa*, Hb., described ab. *lusoria* of Hb. (nec L.), plt. 65; fig. 318 (1800-03). After giving a summary of the variation of the ground colour of this almost markingless species he cited the forms (2) ab. *astragali*, Ramb., from Spain, "more densely covered with dark striae on the forewing, of which the terminal spots are hardly visible"; (3) ab. *dilutior*, Stdgr., from the Kentei Mts., has paler less marked forewings; (4) ab. *decolor*, Warr., 68 f., is much paler and without any brown tinge in the Engadine.

Tutt dealt in some detail with this species, which he called the "commonest of the genus." He gave a translation of the description by

the author, Tr. (1) Next he dealt with Haworth's *lusoria*, a Syn.; (2) the ab. *ludicra*, Haw., "a rather dark form of *pastinum*"; (3) he names a pale form ab. *pallida*. Neither of these two abs. were referred to by Warr.-Stz. They are attached to British *pastinum*.

Of the Variation Barrett said:

There is some variation, in the degree of ashy-grey dusting of the forewings and in the distinctness of the transverse lines, but much more in the form of the curious mark which indicates the reniform stigma; this is often triangular at the base with the apex produced, or frequently almost crescent shaped, or with any intermediate variation, and the succeeding black-brown dots are frequently reduced to one, or even totally absent. In the collection of Mr S. J. Capper is a specimen in which the stigmatic marking is laid prostrate and formed into a broad black wedge pointing towards the base of the wing, outside it is a narrow black streak, replacing the two dots.

The Names and Forms to be considered:

pastinum, Tr. (1826), *Schmett.*, V (3), 297 [Tutt, *B.N.*, IV, 42 (1892)].
lusoria, Haw. (1809), 259 (*Phytometra*) [Fab., *Ent. Sys.*, II, 64, 1791?]
 ab. *ludicra*, Haw. (1809), *l.c.*, and Tutt, *Brit. Noct.*, IV, 42 (1892) [Hb.,
Noct., 65, 319].

ab. *astragali*, H.-S. (1847)?, *Bearbeitr.: Bombyces*, p. 415, 219?, fig. 269
 (=Noctuae) [Warr.-Stz., *Pal. Noctuae*, 111, 273, 373 (1913)].

ab. *dilutior*, Stdgr. (1891), *Iris*, V, 372 [*Cat.*, 252 (1901)].

ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 42.

ab. *decolor*, Warr.-Stz. (1913), *Pal. Noct.*, III, 372, plt. 68.

ab. *elongata*, *Berlin. ent. Cosmos*, I, 9.

ab. *lusoria*, Haw., *Lep. Brit.*, pt. 2, p. 259 (1809).

ORIG. DESCRIP.—"Alis cineras-centibus in medio litura nigra, marginis postico fimbria fusconente collari nigro."

ab. *astragali*, H.-S. (*Bomb.*), *Bearb. Schmett Eur.*, pl. 269, 219 (1847).

DESCRIP.—"From Spain is more dusky covered with dark striae on the forewing, of which the terminal spots are hardly visible." (*Pal. Noct.*, III, 373 (1913).

ab. *dilutior*, Stdgr., *Iris*, V, 372 (1891).

DESCRIP.—[Stdgr., *Cat.*, 252 (1901)] "al. ant. cinesascent minus signatis."

ab. *decolor*, Warr.-Stz., *Pal. Noct.*, III, 372, plt. 68 f. (1913).

ORIG. DESCRIP.—"Is much paler and without any brown tinge: nearly a score of this form were taken in July and August 1901-1903, at Tarasp in the Engadine, by Mr Rothschild and Mr Hartert. They may be identical with ab. *dilutior*, Stdgr., from Kentei."

Placed as definite sp. by Drdt.-Stz. *Supp.*, III, 228.

Toxocampa, Gn., *craccae*, Fab.

Toxocampa, Gn. (852). Most authors. [*Ophiusa*, Hb. (1821).

Eccrita, Led. (1857), Splr.] *craccae*, Fb.

Fab. published his *Mantissa* in 1786. Hubn. began to publish his *Beitrage* in 1781, but did not finish Vol. I until 1789, producing 4 parts, one each year, and it was not until 1789 that he describes *craccae* and adopted the name used by Fab.

Treit., *Schmett. Eur. Noct.*, V, (3), 405, cited nine authors including the Italian Rossi, an unusual referee. The other authors were Hb., *Beitrage*, I, pt. IV (1789), and *Noct.*, f. 520; Schiff., *Verz.*, p. 94, A, a, No. 5 (1775); Illiger, *N. Ausg.*, I, 555, No. 3 (1801); Fab., *Ent. Sys.*, III, (2), p. 64 (179); Bork., *Eur. Schmet.*, IV, 803 (1792); Ernst & Engr., *Pap. d'Eur.*, VII, 148, fig. 601 (1793); De Vill., *Ent. Linn.*, IV, p. 465 (1780); Göze, *Beitr.*, III, (3), 224 (1781). Additional references may be found in some of these.

Warr.-Stz., *Pal. Noct.*, III, 373, plt. 68 f (1913), placed this species in the genus *Ophiusa*, Hb., next to *pastinum*, Tr., as closely allied. They describe the forewing as a darker grey than that of *pastinum*, and with a "dirty white" tinge, striated and dusted with darker, the veins pale. They deal with ab. *immaculata*, Stdgr., and describe three new subsp.: *laevigata*, from the S. Tyrol, 68 g; *grisea*, from Uralsk, 68 g; *lutosa*, S. Europe, 68 h; and ab. *brunnea*, 68 h. All were figured.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 227 (1936), discarded the genus *Ophiusa*, Hb., and returns to *Toxocampa*. He records *perstrigata*, Rebel, a form from Transylvania; ssp. *caliginosa*, Schwrd., from Vez-zavona, Corsica; and spp. *plumbea*, Bankes, from Britain.

Tutt had nothing to say about this extremely local and rare drab insect. He gave the Latin description of the typical form given by Fabricius in the *Mantissa*, p. 154 (1786), but he did not say in which *Mantissa* of the six Fab. published at various times.

Of the Variation Barrett said:

Hardly variable, except in the degree of ashy-white dusting. Sometimes this is almost absent, leaving the forewings of the pale umbreous ground colour, or even with a tinge of purple in the brown. A considerable number of such specimens were reared in 1896 by Mr Percy Bright.

The Names and Forms to be considered:

Craccae, Fab. (1786), *Mantissa*, 154.

ab. *caliginosa*, Schward. (1931), *Zeit. Ost. Ent. Ver. Wien*, XVI, 54.

ab. *plumbea*, Bankes (1906), *Ent. Rec.*, XVIII, 68, 345.

ab. *perstrigata*, Rbl. (1911), *Ann. Hofmus Wien*, XXV, 345.

ssp. *laevigata*, Warr.-Stz. (1913), *Pal. Noct.*, III, 375, plt. 65 f.

ssp. *grisea*, Warr.-Stz., *l.c.*, plt. 65 g.

ab. *brunnea*, Warr.-Stz., *l.c.*, plt. 65 h.

ssp. *lutosa*, Warr.-Stz., *l.c.*

ab. *immaculata*, Stdgr., *Cat.*, III, p. 252 (1901).

ORIG. DESCRIP.—“Al. ant. macula reniforme non suffnulla (non nigro maculata).”

ab. *plumbea*, Bankes, *Ent. Record*, XVIII, 68 (1906).

ORIG. DESCRIP.—“Head anteriorly, and thorax (with tegulae) bluish-grey; head posteriorly, and collar, velvety brownish-black. Forewings bluish-grey, more or less mixed with chocolate-brown, and with the terminal third much obscured by it. The costal black spots and triangular subterminal shade are proportionately darker than in the type. Reniform stigma chocolate-brown, partly black margined, orbicular represented either by a black dot, sometimes white-ringed, or only a minute white spot. Hindwings brownish-grey, more dusky posteriorly. Abdomen brownish-grey.”

ab. *perstrigata*, Rbl., *Ann. Hofmus. Wien*, XXV, 345 (1911).

DESCRIP.—[Drdt., *Pal. Noct. Supp.*, III, 227 (1936). “From Transylvania, it has very prominent transverse stripes.”]

subsp. *laevigata*, Warr.-Stz., *Pal. Noct.*, III, 373, plt. 68 f. (1913).

ORIG. DESCRIP.—“From the South Tyrol, is large, with forewings slate coloured and without darker dusting.”

subsp. *grisea*, Warr.-Stz., *l.c.*, plt. 68 g.

ORIG. DESCRIP.—“The forewing has the costal spots prominently black, the inner and outer lines dark fuscous and distinct, the space between them and the terminal area both dark grey, contrasting strongly with the paler basal area and pale outward edging of the outer line; reniform stigma has the inner edge finely black, but is filled up with the dark grey of the median area, its outer edge being represented by two or three black points only; the pale veins show up distinctly in the dark grey suffusion; the hindwing is wholly dark fuscous.”

ab. *brunnea*, Warr.-Stz., *l.c.*, plt. 68 h.

ORIG. DESCRIP.—“Instead of the typical grey ground colour, is brown, sometimes with a rufous tinge.”

subsp. *lutosa*, Warr.-Stz., *l.c.*

ORIG. DESCRIP.—“Have, from the South of France, luteous grey in the forewings, luteous ochreous in the hindwing.”

ab. *caliginosa*, Schwardt., *Zeit. Öst. Ent. Ver. Wien*, XVI, 54 (1931).

ORIG. DESCRIP.—“Two small pairs from the Col. de Vizzavona, are striking. The fore and hindwings are much darker than in our forms. In one ♀ the forewing in the basal land median areas blackish-grey. The pale veining is scarcely to be seen. In two examples, ♂ and ♂.”

Stilbia, Stephens, *anomala*, Haw.

Stilbia, Stephens (1830). Nearly all authors. [*Ophuisa*, Bdv.]

This is another of the drab species, all of which are unsatisfactory from a nomenclature point of view.

Warr.-Stz., *Pal. Noct.*, III, 204, fig. 42 c (1911), listed these 3 as syn.: *hybridata*, Ill., *stagnicola*, Tr., and *anomala*, Steph. He dealt with (1) *philopalis*, Graslin, S. of France, smaller, paler markings more prominent; (2) *andalusica*, Stdgr., smaller, less distinct marking; (3) *syriac*, Stdgr., Asia Minor, wings broader, hindwings very dark; (4) ab. *calberlae*, Failla, from Sicily, is certainly a good aberration; the males are blacker in the forewings than the females of the typical form; and the hindwings brightly white.

[“A somewhat local species found in England, France, Germany, Spain and Sicily, and in Syria.”]

Drdt.-Stz., *Pal. Noct. Supp.*, III, *Noct.*, III, 178, gave a better fig. Fig. 42 and the material in the species gathered for the main edition was of such poor condition that the figures could not be satisfactory. Drdt. said that *philopalis* was a genuine species with the Spanish *andalusica*, Stdgr., as a form of it; and that the *calberlae* of Sicily was another genuine species.

The new figures given were 42 e, ♂, ♀.

Of the Variation Barrett said:

Not very variable, except that the female is sometimes blackish-slate with hardly any marking. On the other hand, in western districts, and especially in Ireland, both sexes are occasionally large in size, with unusually distinct markings.

Tutt called attention to the remarkable sexual variation. The ♀ was considerably smaller and of an almost uniform blackish-brown and devoid of all markings. He discussed the habitat especially: Aberdeen and Sligo. He cited the remarks of Treit., Guen. and Wheeler, and reported too the description of the typical form described by Haw. Treit., *Ent. Soc.*, London, 1812. Tutt ended by recording (1) ab. *stagnicola*, Tr., and the brightest of the forms ever to leaden-blue; (2) ab. *philopalis*, Gras. (later considered a species).

The Names and Forms to be considered:

anomala, Haw. (1812), *Trans. Ent. Soc. Lond.*, 336.

hybridata, Hb. (1800-3), “Geom,” 497-8. Syn.

stagnicola, Tr. (1825), *Fur. Schm.*, V (2), 268.

anomala, Steph. (1829), *Curtis Brit. Entomology*, Vol. XIV, plt. 631.

Syn.

philopalis, Gras. (1852), *Ann. Soc. Ent. France*, 413, plt. 8. 3.

calberlae, Failla (1890), *Ted. Sp.*

andalusica, Stdgr. (1891), *Iris*, VI, 290. Sp.

syriaca, Stdgr. (1892), *Iris*, VI, 290.

insularis, Fuch. (1903), *Soc. Ent.*, XVIII, 4.

ab. *insularis*, Fuchs., *Soc. Ent.*, XVIII, 9 (1903).

ORIG. DESCRIP.—“Smaller, forewing elongate, glossy iron-black, brownish suffused on the inner margin, with smaller, rounder, less oblique orbicular and indistinct reniform stigmata, with black darkening between the stigmata, the first-cross line twice slightly toothed; hindwing broad and bellied, very light white-grey, yellowish tinted, with washed-out curved streak-like darkening before the margin. ♂. 14 mm. Sicily.”

var. *syriaca*, Stdgr., *Iris*, IV, 290 (1891).

ORIG. DESCRIP.—“A quite fresh male, but with the R. hindwing much rubbed, forms a strong contrast to var. *andalusica*; this I name var. *syriaca*, and compared with var. *andalusica* one might take it for quite a different species. It is 25 mm. in expanse, has much broader forewings, which are somewhat darker coloured than in the typical form, but are quite similarly obsolescently marked. The hindwings are quite unicolorous dark blackish-grey, much darker than in the typical form. The dark fringes have a dark, wide basal line.”

Stilbia anomala.

ab. *philopalis*. Smaller and paler; forewing with the markings more prominent. S.E. France.

ab. *andalusica*. Small; forewing with the markings indistinct. Andalusia.

ab. *syriaca*. Wings broader; hindwing darker. Syria.

Catocala, Schrnk., *fraxini*, L.

Catocala, Schrnk. (1802), practically all authors. [Ochs. & Treit. (1826)].

Hb., Verz. (1816), No. 2713, "*Catocala*."

Warr.-Stz., *Pal. Noct.*, III, 304, plt. 54 d (1913), dealt with the species form in a condensed and very good description. He cited (1) ab. *moerens*, 54 d, forewing more or less suffused with blackish scales obscuring the markings; (2) ab. *gaudens*, 54 d, very pale with most of the black scaling obsolete, from Central Asia; (3) ab. *contigua*, 54 e, has the pale spot below the reniform elongated outward to touch the outer line, often as well as the outer line itself; strongly yellow-tinged, particularly noticeable in examples especially with the ground colour dark; (4) ab. *angustata*: narrowness of the blue band of the hindwing; (5) ab. *maculata*: a white mark at lower angle of the cell of the hindwing. Strong development of grey scales produces rare cases of albinism.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 212 (1935), reviewed the earlier names and then cited the later ones: (1) ab. *atra*, an extreme *moerens*, completely blackened forewing and thorax; (2) ab. *caerulescens*, distinctly suffused with bluish, a transition to *moerens*?; (3) *contigua* (*longimaculata*, is a Syn.); (4) ab. *caeruleomaculata*, a blue patch in the black basal area of the hindwing, otherwise it may be *moerens*; (5) ab. *argillacea*, forewings grey-white, markings faintly indicated, transverse lines pale yellow, edged with black, the spot below the reniform is also yellow; (6) ab. *latefasciata*, from Amur, blue bands of the hindwings are strikingly wider; (7) ab. 2 mm. wider than normal European specimens. Assuri. *sternecki*, the blue band of the hindwing is double as wide. Bal. Prague.

Tutt, in *Brit. Noct.* (1892), saw but little variation in *fraxini* and quoted the statement of Gn. in support. *Noctuelles*, Vol. VII, 8, 8 (1852). But he gave a long detailed description from Treit., *Schmett. Noct.*, V (3), where the variation of each feature of the markings was described.

Barrett does not refer to any Variation.

References to the Names and Forms:

fraxini, L. (1758), *Sys. Nat.*, Xed., 512.

ab. *moerens*, Fuch. (1889), *Jahr. Nass. Ver. Nat.*, XIII, 210.

ab. *gaudens*, Stdgr. (1901), *Cat.*, IIIed., 247.

r. *maculata*, Kusenov (1901), *Rev. Russ. Ent.*, I, 230.

ab. *contigua*, Schultz. (1906), *Ent. Zeit.*, XX, 86.

ab. *angustata*, Schultz. (1906), *l.c.*

ab. *albina*, Schultz. (1906), *Ent. Zeit.*, XX, 86.

ab. *atra*, Spul. (1908), *Schmett. Eur.*, I, 367.

ab. *argillacea*, Vincent. (1910), *Bull. Soc. Ent. Fr.*, 316.

ab. *latefasciata*, Warn. (1911), *Int. Ent. Zeit.*, XIII, 25.

r. *sternecki*, Harockke (1911), *Jahrl. Wien*, XXI, 94.

ab. *caeruleocens*, Closs. (1918), *Int. Ent. Zeit.*, XII, 34-35.

ab. *longimaculata*, Closs. (1918), *l.c.* =Schultz., cf. Syn. of *contigua*.

ab. *caerulesmaculata*, Closs. (1918), *Int. Ent. Zeit.*, XII., 35.

P.S.—The Original Descriptions are omitted. They are mostly redundant, and the species is of rare occurrence in Britain.

C. fraxini is not a British species but only a rare immigrant. I have not given the descriptions of the various aberrations. But I am informed that ab. *contigua* and ab. *gaudens* have been bred here recently. I have included the descriptions.

ab. *contigua*, Schultz., *Ent. Zeit.*, XX, 86 (1906).

ORIG. DESCIP.—“Distinguished from the typical form, in that the light spot below the reniform stigma of the forewing, which in the type form is found of a roundish or irregular quadrangular shape, is produced in length very considerably towards the margin; it reaches up to the double toothed line in which it runs. Sometimes the characteristic marking of this aberration is that the double zigzag line is strongly yellowish powdered. Particularly fine are the examples of this aberration in which the ground colour on the forewings is strongly dusted, in which case the light longitudinal streak stands out especially distinct from the colour of the rest of the wing.”

race *gaudens*, Stdgr., *Cat. Lep. Pal.*, 247 (1901).

ORIG. DESCIP.—“Multo dilutior, al. ant. albido-cinereis.”

Hamp., *Cat. Lep. Ph.*, XII, 67 (1913). Much paler; forewing grey-white.—W. Turkestan.

Catocala, Schranck, *nupta*, L.

Catocala, Schranck (1802), *Fn. Bosa*, most authors (Hb., *Verz.* (1817, No. 2716).]

nupta, Linn. (1766-67), *Sys. Nat.* (XIIed.), p. 841.

Bork., *Eur. Schmett.*, IV, *Noct.*, 17, No. 6 (1792), gave a very useful series of extracts from earlier authors, pp. 19-23. (1) Linn., *Sys. Nat.*, Ed. XII, p. 841, sp. 19 (1767), is the typical description recognized until it was replaced by Ed. X (1758); (2) De Vill., *Ent. Linn.*, II, 207 (1775), No. 181 (1789); (3) Fabricius, *Sys. Ent.*, p. 602, No. 52 (1773). *Species Insect.*, II, 221, No. 70 (1781), *Mantissa Ins.*, II, 142, No. 110 (1787); (17a) (4) Esper., *Eulen (Noctua)*, IV, p. 119, plt. 97, noct. 18, (1787); (17a) (4) Esper., *Culen (Noctua)*, IV, p. 119, plt. 97, noct. 18, fig. 1 (1786); (5) (Schiff.) *Syst. Verz. Wien.*, Fam., X. 90, No. 5 (1775); (6) Sepp., *Nederland Ins.*, IV, 33, plt. 7 (17); he also cited Müller, *Uebersets* (1776); Goeze, *Beitr.*, III (3) and III, No. 119 (1781); Lang., *Verz. Papillons d'Europe*.

Treit., *Schmett. Eur. Noct.*, V (3), 337 (1826), described the species and gave its life-history with reference to a closely-allied species, *elocata*, and cited (1) Hb., *Noct.*, 350 (1803); (2) Illiger, *Verz.* (Neu. Ausgang), I, 336, No. 4 (1801), *N. Magazine*, II, 143, No. 4 (1803); (3) Ernst. & Engram, *Pap. d'Eur.*, VIII, 71, fig. 565 (1792); (4) View., *Tab. Verz.*, II, 34, No. 47 (1790); (5) Hufn., *Berl. Mag.*, III (2), p. 210 (1766); (6) *Naturfor*, Rottembg., 18, 112, No. 10 (12), *pacta*. (1776); (7) Laspeyres, *Krit. Rev.*, p. 111 (1803); (8) Borkh., *Eur. Schmett.*, IV, 17, No. 6 (1792). List of early authors also given by Treit.

Warr.-Stz., *Pal. Noct.*, III, 304, plt. 55 a, gave a rather long detailed description. He cited (1) ab. *concupina*, Hb., 55 a. The red of the hindwing is brighter and the black median band more developed, being broader throughout and continued to inner margin; the lines of forewing blacker and the pale areas generally more developed; (2) the subsp. *nuptialis*, Stdgr., from Thibet, Issykul and the Altai Mts. has the forewing paler, more gaily marked, the submarginal line white, sharply edged with black; (3) subsp. *obscurata*, Obthr., Amurland and Askold Is., is a much blacker form than the average European examples, though specimens from several localities in Europe are also dark; (7) ab. *coerulescens*, Ckrll., named from a single specimen taken in Essex, has the hindwing blue instead of red; (5) ab. *brunnescens*, Warr., 55 b, represented by 3 rather small ♂♂, captured near London, has the hindwing dark olive brown; (6) ab. *languescens*, nov. Warr., 55 a, the hindwing is yellowish-white with a faint pink flush; (7) ab. *flava*, Schultz., in which the hindwing is yellow; (8) ab. *mutilata*, Schultz., the black ventral base of hindwing is abbreviated and becomes obsolete a little below costa; (9) ab. *fida*, Schultz., differs from typical examples in having between the submarginal line and the termen a conspicuous dentated white line strongly edged with black, Spain; (10) ab. *dilutior*, Schultz., ground colour generally paler, either brownish-

yellow with the dark markings slightly darker or whitish-grey with a faint yellowish intermixture; (11) ab. *alterata*, Warr. nov. = (ab. 6, Hamps.), has the black band of the hindwing altered to grey; (12) ab. *rubridens*, Warr. nov., 55 a, shows the red ground colour of the hindwing running out along the veins 2 and 1 in the shape of sharp wedge-shaped teeth almost interrupting the black median band, which is swollen between them like a horseshoe-shaped blotch; (13) ab. *confusa*, Obthr., has the whole forewing blurred dark grey, with the inner and other lines and the reniform stigma, but diffuse on a slightly paler median area, the median band of hindwing strongly curved, its outer edge diffuse, etc., etc. N. and Central Asia and Amurland.

Hamp., *Lep. Phal.*, XII, 85.

ab. 1 (1), *unicuba*: "Forewing suffused with fuscous."

Hamp., *Lep. Phal.*, XII, 85.

ab. (2), *nuptialis*: "Forewing paler grey."

Hamp., *Lep. Phal.*, XII, 85.

ab. (3)c, *fida*: "Forewing with the terminal area whitish."

Hamp., *Lep. Phal.*, XII, 85.

ab. (4), "*mutilata*": "Hindwing with the medial band shorter."

Hamp., *Lep. Phal.*, XII, 85.

ab. (5), *flava*: "Hindwing with the costal half orange yellow."

Hamp., *Lep. Phal.*, XII, 85.

ab. (6): "Hindwing with the bands pale grey instead of black."

Culot, *Noct. et G.*, I (8), 194, plt. 76, 1 (1916), stated that *nupta* was the commonest species of the genus in the countries included in the area (Swiss) of Central Europe. He then discussed the specimens in his own collection from the Eastern area of Central Europe, Russia in Europe, one from the Sarepta district (The Volga), the other from the Caspian area, the former the *nupta* of Central Europe, while the latter was an approach to *adultera*, Men., of Arctic Russia.

After stating that there was no possible confusion of *nupta*, he went on to the wing markings and the variation, and then cites *flava*, Schultz.; *languescens*, Warr.; *brunnescens*, Warr.; and *confusa*, Warr. Culot did not possess *adultera*, but in 1916, while he was writing his work, he obtained the species and numerous other examples were taken in Europe.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 213 (1935), cited (1) ab. *griseus*, Hannemann, monotonously brownish-grey specimens with diffuse markings; (2) ab. *nigrescens*, Hanne., darker grey-black specimens, with darker markings and no pale patches. Both Berlin; (3) ab. *xanthophaea*, Schaw., has brownish-yellow hindwings (while *flava* has pure yellow, *languescens* whitish-yellow with rosy suffusion. Klosterneuberg, near Vienna; (4) ab. *guiastii* is probably very similar to *coerulescens*, Ckrl., it has hindwings suffused with bluish-black, while in *coerulescens* they are dark brown with violet sheen. Belgium; (5) ab. *kansuensis*, O. Bng.-Hs., has pale grey forewings with very indistinct markings, in the ♀ blue-grey with white patch below the reniform stigma, which is connected to the other transverse stripe by a ribboned band. Hindwings pale red with abbreviated narrower central band. Richthofen Mts.; (6) ab. *clara*, Obthr., is a larger form with much paler pure pale grey forewings that are more faintly dusted, so that the two black trans-

verse lines stand out sharply. The central area around the reniform towards the costa is more heavily dusky blackish; the whitish patch before the reniform is remarkably large, pale and prominent.

Tutt dealt first with the variation in his own collection and gave the description of the typical form. He described the figure of *connubina*. Hb., and discussed the remark of Treit. (*Schmett. Eur.*, V (3)). Finally he cited the three aberrations: (1) ab. *caerulescens*, Ckrl., a dichroic form; (2) ab. *conubina*, Bork.; and (3) ab. *obscurata*, Obthr.

Of the Variation Barrett said:

Usually very constant in colour and markings, occasionally a remarkable exception is met with; one now in the collection of Dr P. B. Mason at Burton-on-Trent is magnificent, the forewings being suffused with bluish-slate, the hindwings almost black, the usual red areas being wholly suffused with smoky red-black, while the bands are almost blue-black. This specimen was reared by Mr J. H. Smart, of Plumstead, Kent, from a larva found in that neighbourhood. An example in which the red colour of the hindwings was replaced by blue—as in the last species—appears to have been taken at Colchester in 1889. Another taken at Mitcham, Surrey, in 1888 by Mr M. Winckley has the forewings much darkened, and the hind with the usual red colour replaced by a warm brown, the black bands shot with purple, and a purplish glow over the entire surface. Occasional specimens have the hindwings of a dull brick red; and Mr W. West, of Streatham, has one in which they are shot with yellow.

Tutt, after his introductory remarks, gave the Linn.'s Later Description in the XIIth edn., *Sys. Nat.*, p. 841 (1767). He then discussed the remarks of Treit., the figure in Esper and Hubner's figure. He again gives further notes from Triet. Only three forms were recorded: (1) *caerulescens* of Ckrl., a form considered a synonym of ab. *brunnea* by some: (2) form *concubina*, Bork., figured by Hb. and discussed and figured by Sepp. (Nederland Ins.) treated now as a Syn.; (3) *obscurata*, Obthr., a form found throughout the whole of the central area of the Palaearctic Region.

The Names and Forms to be considered:

- nupta*, L. (1767), *Sys. Nat.*, XIIed., 841.
- ab. *concubina*, Hb. (1800-3), *Noct.*, 329. Syn.
- ab. *inibuba*, Walk. (1857), *Cat. Noct.*, XIII, 1210. Sp.
- ab. *obscurata*, Obthr. (1880), *Etudes.*, V, 86.
- ab. *confusa*, Obthr. (1881) [Warr.-Stz., *Pal. Noct.*, II, 304 (1913)].
- ab. *caerulescens*, Ckrl. (1889), *Ent.*, XXII, 127 [Tutt, *Brit. Noct.*, IV, 51 (1892)].
- ab. *nuptialis*, Stdgr. (1901), *Cat.*, IIIed., 248.
- ab. *guartii*, Lamb. (1905), *Reva Namuroise*, p. 2.
- ab. *flava*, Schultz. (1906), *Ent. Zt.*, XX, 86 [Stz., *Pal. Noct.*, III, 304].
- ab. *mutilata*, Schultz. (1906), *Ent. Zt.*, X, 194 [Stz., *Pal. Noct.*, III, 304].
- ab. *fida*, Schultz. (1909), *Ent. Zt.*, XXII, 169 [Stz., *Pal. Noct.*, III, 304].

- ab. *dilutior*, Schultz. (1909), *Ent. Zt.*, XXII, 169 [Stz., *Pal. Noct.*, III, 304].
- ab. *brunnescens*, Warr.-Stz. (1913), *Pal. Noct.*, III, 305.
- ab. *languescens*, Warr. (1913), *l.c.*
- ab. *alterata*, Warr. (1913), *l.c.*
- ab. *rubridens*, Warr.-Stz. (1913), *l.c.*
- ab. *grisea*, Hannem. (1917) [(1935), Drdt.-Stz., *Pal. Noct. Supp.*, III, 212].
- ab. *nigrescens*, Hannem. (1917) [(1935), *l.c.*].
- ab. *xanthophaea*, Schaw. (1925), *Zeit. Öst. Ent. Ver. Wien*, X, 47.
- ab. *clara*, Obthr. [Drdt.-Stz., *Supp. Pal. Noct.*, III, 212 (1935).
- subsp. *kansuensi*, O.-B., *Horae. Macrolep.*, p. 88.
- ab. *salmonia*, Ckyne. (1946), *Ent. Record*, LVIII, 75.
- ab. *nigra*, Lempke. (1948), *Ent. Tids.*, XC (VIII), p. 104.
- ab. *variegata*, Lempke. (1948), *l.c.*
- ab. *sanguinea*, Lempke. (1948), *l.c.*

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MEETINGS OF SOCIETIES.

Royal Entomological Society of London, 41 Queen's Gate, S.W.7: January 18th, 1950 (Annual Meeting); February 1st, at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1: Jany. 11th; Jany. 25th (Annual Meeting). *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*. Monthly Meetings are held at Museum and Art Gallery. Particulars from Hon. Secretary, H. E. Hammond, F.R.E.S., 16 Elton Grove, Acocks Green, Birmingham:

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Change of Addresses:—Capt. K. J. Hayward has returned to his previous Argentine address. T. Bainbrigge Fletcher, R.N., F.L.S., F.Z.S., F.R.E.S., Woodfold, Down Hatherley, Gloucester.

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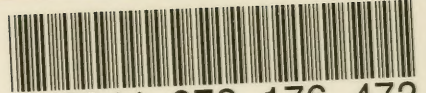
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